

TC 0076-06

# **FINAL REPORT REMEDIAL INVESTIGATION**

## **BUILDING 216**

## **CAMP NAVAJO BELLEMONT, ARIZONA**

December 1997

*Prepared for:*

**US Army Corps of Engineers**  
Sacramento District  
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and

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**REMEDIAL INVESTIGATION  
AT  
CAMP NAVAJO**

**BUILDING 216**

**FINAL REPORT**

**Contract DACA05-93-D-0019**

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## LIST OF ACRONYMS

Acronym	Full Phrase
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ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
AMC	Army Material Command
APE	ammunition particular equipment
bgs	below ground service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COC	chemical of concern
DNSC	Defense National Stockpile Center
ESE	Environmental Science and Engineering
GSA	General Services Administration
HA	hand auger
HBGL	Health Based Guidance Levels
HGX	commercial mercury cleaning compound
LDC	Laboratory Data Consultants
mg/kg	milligram per kilogram
mg/l	milligrams per liter
MS	matrix spike
OMS	Organization Maintenance Shop
pcf	pounds per cubic feet
PRG	Preliminary Remediation Goals
QA	Quality Assurance
QC	Quality Control
RI	remedial investigation
RPD	relative percent difference
SS	surface soil
TPH-d	total petroleum hydrocarbons as diesel
TRPH	total recoverable petroleum hydrocarbons
1g/l	micrograms per liter
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
UST	underground storage tank

# SECTION 1

## INTRODUCTION

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### 1.1. PURPOSE OF REPORT

This report summarizes the results of the remedial investigation conducted at Building 216 (NAAD 24B, NADA 24B, AREE 24) (site) at Camp Navajo (formerly Navajo Depot Activity), in Bellemont, Arizona (Figure 1-1). Tetra Tech was retained by the United States Army Corps of Engineers (USACE) to conduct the work described in this report.

### 1.2. SITE BACKGROUND

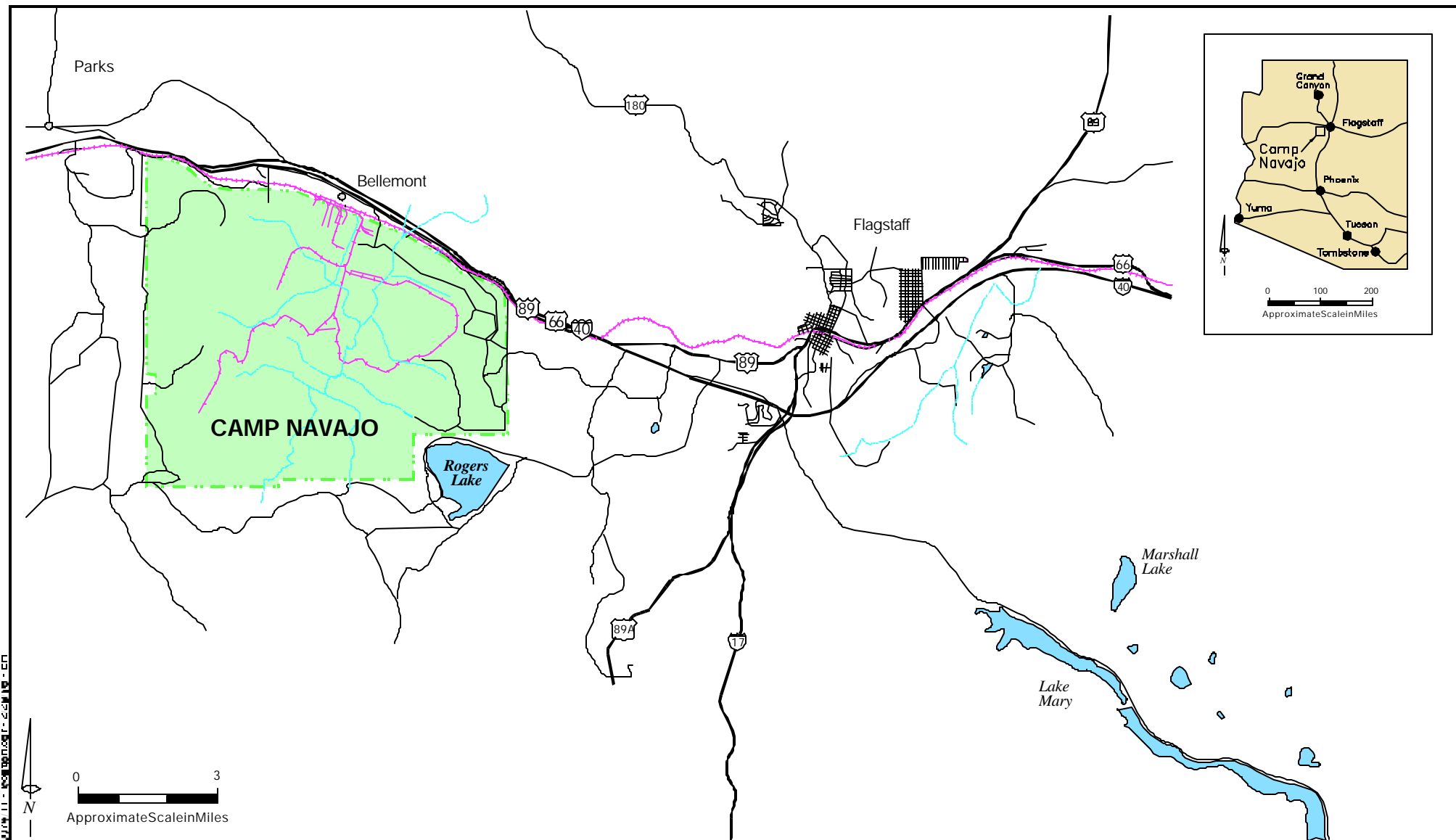
#### 1.2.1. Site Description

Building 216 is an 18,207 square foot, concrete-floored building with 12 bays on each side (Figure 1-2) and is located in the warehouse area (Figure 1-3) (Uribe 1993a). The building was operated by the Arizona National Guard for four to five years in the early 1980s and was referred to as the organizational maintenance shop (OMS) before the new OMS facility was constructed. There are no hoist pits or floor drains in this building (Uribe 1993a), and little information is available concerning its former uses. Spray painting and welding activities occurred in this building, and paint thinners (petroleum distillates) have been identified as a potential contaminant.

Adjacent to the east side of Building 216 is a derelict heating plant, Building 217. An underground storage tank (UST) at the heating plant was removed on August 14, 1991, and is sometimes identified as the UST at Building 216 and sometimes as the UST at Building 217.





#### 1.2.2. Previous Investigations

A UST was suspected to be present under an old fuel island between Buildings 218 and 216. Capped fill pipes projected from the island, in September 1994, the area was excavated and no UST was found. The pipes at the fuel island were found to have connected to a UST formerly located at Building 205. These pipes were



Camp Navajo is in north central Arizona about 12 miles west of the city of Flagstaff.

#### LEGEND:

-  Highways
-  Roads
-  Railroad
-  Rivers/Streams





## Camp Navajo Location Map

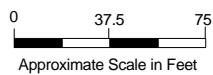
Camp Navajo  
Bellemont, Arizona

Figure 1-1



**Legend:**

-  Utility Pole
-  Drain
-  Fire Hydrant
-  Railroad



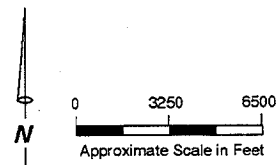
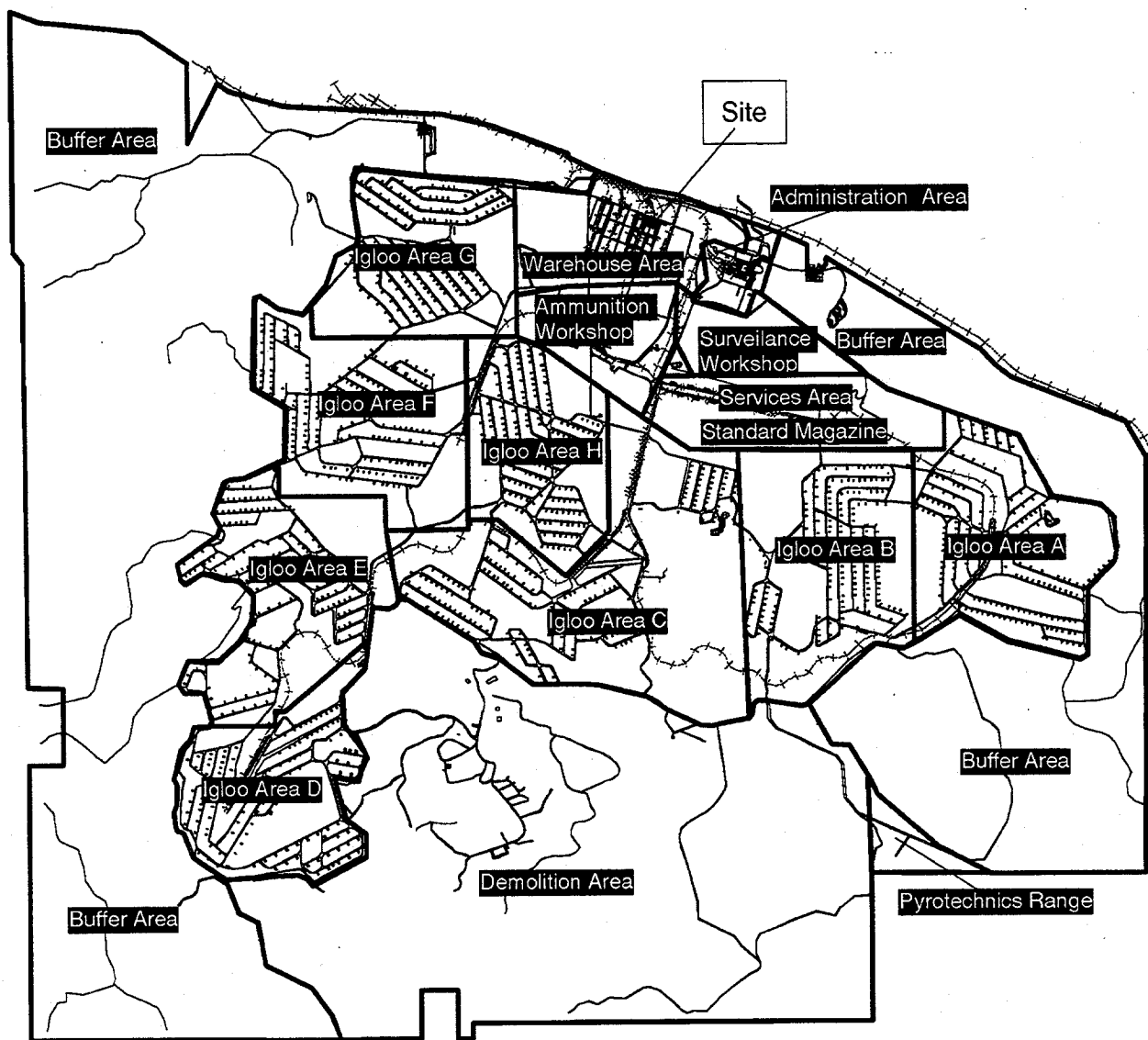
## **Building 216 - Spray Paint Operations**

### **Site Plan**

Camp Navajo, Bellemont, Arizona

**Figure 1-2**





## ***Building 216 - Spray Paint Operations Site Map***

Camp Navajo, Belmont, Arizona

**Figure 1-3**



Tetra Tech, Inc.

removed and the excavation was sampled and backfilled (Tetra Tech 1995). Fifteen soil samples were collected from beneath the excavated piping. Samples contained total petroleum hydrocarbons as diesel (TPH-d) (67 mg/kg), total recoverable petroleum hydrocarbons (TRPH) (18 to 170 mg/kg), toluene (1,400 µg/kg), ethylbenzene (1,700 µg/kg), and xylenes (nondetect to 8,000 µg/kg). Two perched ground water samples collected from the depressions created at two soil sample locations contained TPHd (4.9 mg/l), TRPH (19 mg/l), toluene (8.7 1g/l), and xylenes (100 1g/l).

### **1.3. STATEMENT OF THE PROBLEM**

Previous operations at this site are likely to have generated metal, petroleum hydrocarbon, and solvent wastes. Some of these waste materials may have been thrown out the doors of the building for disposal. In addition, because operations at this site involved the handling of liquid waste product (petroleum hydrocarbons and solvents), it is likely that spills occurred periodically. Of specific concern at the site is determining the extent of contamination in the soils beneath and surrounding the buildings. The shallow ground water, in basalt fractures 20-50 feet beneath the site, is utilized by the base as a drinking water supply.

### **1.4. REPORT ORGANIZATION**

This report follows United States Environmental Protection Agency (USEPA) guidance for remedial investigation (RI) reports in the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (USEPA 1988). Section 2 describes the field investigations conducted as part of the RI. Sections 3 and 4 present the physical and chemical results, respectively. Section 5 presents risk screening for the identified contaminants. All results are summarized with conclusions in Section 6.

## SECTION 2

# SAMPLING PROGRAM

---

### 2.1. SAMPLING OBJECTIVES

The specific objectives of the investigation at the Building 216 included identifying buried piping for subsurface sampling, characterizing the nature and extent of surface and subsurface contamination from maintenance activities that could have been discharged to the site.

### 2.2. SAMPLING APPROACH

Photo documentation is provided in Appendix A. Field notes are presented in Appendix B. Field investigations were conducted in accordance with the procedures outlined in the field sampling plan provided in Appendix C. Geophysical survey results can be found in Appendix D. Surveyor results can be found in Appendix E.

#### ***Task 1: Geophysics***

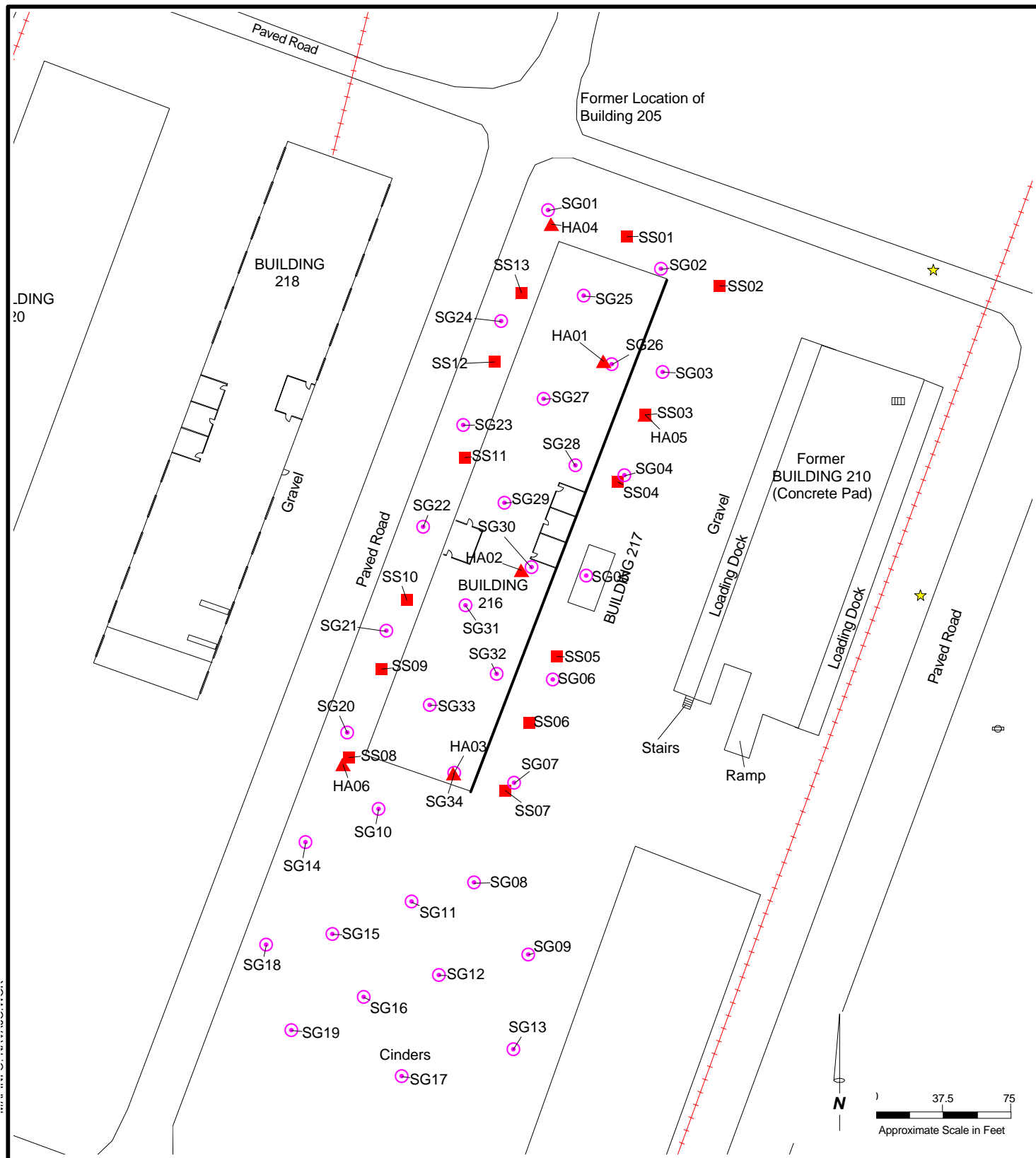
A line locator survey was conducted within a 20-foot zone surrounding the building and surrounding subsurface sampling areas (Figure 2-1). In areas where possible drain piping was discovered, the piping was traced from its origin to its discharge point. All drain piping was determined to be connected to the sanitary sewer system.

#### ***Task 2: Passive Soil Gas Survey***

Soil gas probes were installed at 34 locations inside and surrounding the building and in the gravel lot south of the building (Figure 2-1). The probes were installed on a 40 by 60 foot grid.

#### ***Task 3: Surface Soil Sampling***

Surface soil sampling was performed in targeted locations deemed likely to represent worst case conditions based on engineering judgment. Surface samples were collected on unpaved areas outside alternating vehicle bay door, (Figure 2-1). Surface soil samples were collected from 13 locations around Building 216. Surface soil samples were collected by driving a 2-inch by 12-inch California modified split spoon sampler



**Legend:**

- |  |                     |  |                                     |
|--|---------------------|--|-------------------------------------|
|  | Drain               |  | Manhole                             |
|  | Hand Auger Location |  | Railroad                            |
|  | Fire Hydrant        |  | Soil Gas Location                   |
|  |                     |  | Surface Soil Sample/Sediment Sample |

## Building 216 - Spray Paint Operations Investigation Plan

Camp Navajo, Bellemont, Arizona

into the ground surface, as described in Appendix C. As shown in [Table 2-1](#), surface soil samples were analyzed for metals, petroleum hydrocarbons, percent water, and pH. Two samples also were analyzed for total organic carbon (TOC), redox potential, bulk density, and grain size.

#### **Task 4: Hand Auger Sampling**

Six hand auger borings were sampled within and surrounding the building ([Figure 2-1](#)). Samples were collected at 0.5, 2.5 feet, and 5 feet below ground surface (bgs) from hand auger borings HA01 and HA03. Samples from hand auger boring HA03 were only collected at 0.5 and 2.5 feet depths due to hand auger refusal. Soil samples collected outside the building in hand auger borings HA04, HA05, and HA06 were collected at 2.5 and 5 feet bgs, with the exception of HA04 which encountered refusal prior to collection of the 5-foot sample. Samples were collected by driving a 2-inch by 12-inch California modified split spoon sampler, as described in Appendix C. As shown in [Table 2-1](#), soil samples were analyzed for metals, petroleum hydrocarbons, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), percent water, and pH. Four samples also were analyzed for TOC and redox potential. Two samples were analyzed for bulk density and grain size.

#### **Task 5: Surveying**

After the investigation was completed, Aztech Surveying, an Arizona-licensed land surveyor, surveyed the horizontal location of the samples. Horizontal coordinates for each location were surveyed relative to a permanent control point established on-site. Horizontal control is accurate to  $\pm 0.1$  feet. Elevations of the soil borings, with water associated with them, were surveyed to an accuracy of  $\pm 0.01$  feet. Sample locations in [Figure 2-1](#) are based on survey results. A table of surveyed sample locations is included in Appendix E.

### **2.3. SAMPLE ANALYSIS**

A total of 34 passive soil gas probes and 26 soil samples were collected and analyzed during this investigation. The soil gas probes were analyzed for a select suite of VOCs, SVOCs, and petroleum hydrocarbons by Gore Laboratories in Maryland. Soil sample analyses conducted as part of this investigation included metals, petroleum hydrocarbons, VOCs, SVOCs, pH, TOC, redox potential, percent water, and pH by Quanterra Laboratories in California. Four soil samples also were analyzed for bulk density and particle-size distribution by Earth Tech Laboratories in California. [Table 2-1](#) summarizes the samples collected and the types of analyses conducted on each soil sample.

**Table 2-1**  
**Building 216 - Sample Analyses**

Sample ID	Sample Date	Depth (feet)	Media	Percent Water ASTM D2216	pH SW9045B	Total Organic Carbon WBLACK	Redox Potential ASTM D1498	Dry Density ASTM D2937	Particle-Size Distribution ASTM D422	Metals SW6010A	Mercury SW7471A	Petroleum Hydrocarbons BLS-191	Petroleum Hydrocarbons BLS-418 1 AZ	Volatile Organic Compounds SW8260A	Semivolatile Organic Compounds SW8270B
216-SS01S-01	9/25/95	1	Soil	X	X					X	X	X	X		
216-SS02S-01	9/25/95	1	Soil	X	X					X	X	X	X		
216-SS03S-01	9/25/95	1	Soil	X	X					X	X	X	X		
216-SS04S-01	9/25/95	1	Soil	X	X					X	X	X	X		
216-SS05S-01	9/25/95	1	Soil	X	X	X	X	X	X	X	X	X	X		
216-SS06S-01	9/25/95	1	Soil	X	X					X	X	X	X		
216-SS07S-01	9/25/95	1	Soil	X	X					X	X	X	X		
216-SS08S-01	9/25/95	1	Soil	X	X					X	X	X	X		
216-SS09S-01	9/25/95	1	Soil	X	X					X	X	X	X		
216-SS10S-01	9/25/95	1	Soil	X	X	X	X	X	X	X	X	X	X		
216-SS11S-01	9/26/95	1	Soil	X	X					X	X	X	X		
216-SS12S-01	9/26/95	1	Soil	X	X					X	X	X	X		
216-SS13S-01	9/26/95	1	Soil	X	X					X	X	X	X		
216-SS14S-01*	9/25/95	1	Soil	X	X					X	X	X	X		
216-SS15S-01*	9/25/95	1	Soil	X	X					X	X	X	X		
216-HA01S-01	4/21/96	0.5	Soil	X	X					X	X	X	X		
216-HA01S-02	4/21/96	2.5	Soil	X	X					X	X	X	X	X	X
216-HA01S-03	4/21/96	5	Soil	X	X					X	X	X	X	X	X
216-HA02S-01	4/20/96	0.5	Soil	X	X					X	X	X	X		
216-HA02S-02	4/20/96	2.5	Soil	X	X					X	X	X	X	X	X
216-HA03S-01	4/20/96	0.5	Soil	X	X					X	X	X	X		
216-HA03S-02	4/20/96	2.5	Soil	X	X					X	X	X	X	X	X
216-HA03S-03	4/20/96	5	Soil	X	X					X	X	X	X	X	X
216-HA04S-01	4/20/96	2.5	Soil	X	X	X	X	X	X	X	X	X	X	X	X

**Table 2-1**  
**Building 216 - Sample Analyses**  
*continued*

Sample ID	Sample Date	Depth (feet)	Media	Percent Water ASTM D2216	pH SW9045B	Total Organic Carbon WBLACK	Redox Potential ASTM D1498	Dry Density ASTM D2937	Particle-Size Distribution ASTM D422	Metals SW6010A	Mercury SW7471A	Petroleum Hydrocarbons BLS-191	Petroleum Hydrocarbons BLS-4181AZ	Volatile Organic Compounds SW8260A	Semivolatile Organic Compounds SW8270B
216-HA05S-01	4/20/96	2.5	Soil	X	X					X	X	X	X	X	X
216-HA05S-02	4/20/96	5	Soil	X	X					X	X	X	X	X	X
216-HA06S-01	4/20/96	2.5	Soil	X	X	X	X	X	X	X	X	X	X	X	X
216-HA06S-02	4/20/96	5	Soil	X	X					X	X	X	X	X	X
216-HA07S-01*	4/20/96	2.5	Soil	X	X	X	X			X	X	X	X	X	X
216-HA07S-02*	4/20/96	2.5	Soil	X	X	X	X			X	X	X	X	X	X

Notes:

\* Blind duplicate sample (see section 4.3)  
 ASTM American Society for Testing and Materials

## SECTION 3

# PHYSICAL CHARACTERISTICS

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### 3.1. SURFACE FEATURES

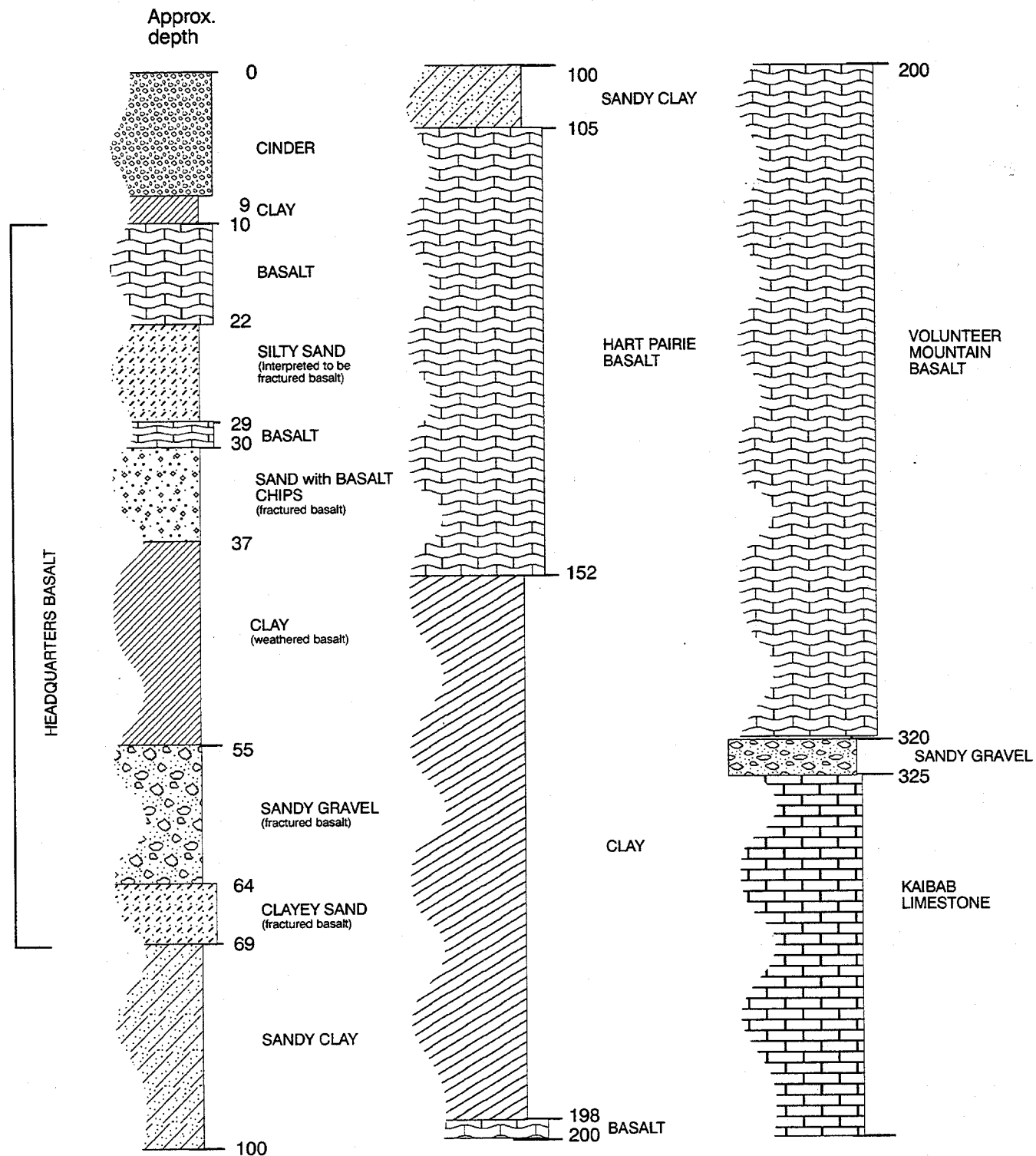
Surface features at the site consist of an 18,207 square feet, concrete-floored steel-framed building with 12 bays on each side (Building 216) and a derelict brick heating plant (Building 217). The building is located in the central portion of the warehouse area between Buildings 218 and 210 (Figure 1-2). The ground on each side of Building 216 is covered by a 20 foot wide strip of concrete pavement. Unpaved ground surface surrounding the building is covered with gravel or grass.

The topography in the area of Building 216 is generally of low relief, and slopes to the south. There is a northeast-southwest trending escarpment approximately 3,000 feet east of the site (Bellemont Fault). This feature has a drop in ground surface elevation of about 80 feet. Ground surface generally consists of gravel with less than 50 percent of sand.

### 3.2. GEOLOGY

The following description of the geologic units deeper than 20 feet is compiled from surface geologic mapping, from soil borings in other portions of the Warehouse Area, and from geophysical surveys (Figure 3-1) (Tetra Tech 1997). A monitoring well drilled in 1996 approximately 500 feet east of the site encountered a thin veneer (<10 feet) of clayey soil overlying a thickness of basalt. This basalt is interpreted to be the Headquarters Basalt which underlies the entire Warehouse Area as well as the adjacent Administration Area. The flow is estimated to be about 60 feet thick and overlies a thickness (<35 feet) of Camp Navajo Clay. The Camp Navajo Clay was deposited directly on top of a second basalt flow. This second basalt flow is interpreted to be the Hart Pairie basalt and is 45 feet thick. Below the second basalt is a second clay (45 feet thick) and a third basalt. The third basalt is interpreted to be the Volunteer Mountain basalt and is 120 feet thick. Below the third basalt is a thin zone of gravel and weathered Kaibab Formation (<20 feet) and the underlying Kaibab Formation.





Source: Tetra Tech, 1996

## Building 216 Stratigraphy

Camp Navajo  
Bellemont, Arizona



#### LIST OF MAP UNITS

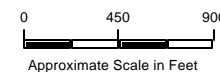
##### Surficial Deposits of Quaternary Age

Qal Alluvial and colluvial deposits (Holocene and Pleistocene)

##### Extrusive Rocks and Sediments of Quaternary and Tertiary Age

Qbb Basalt flows and cinder cones

Qbhb Basalt flows and cinder cones of Hart Pairie



#### Legend:

- Faults
- Lineaments/ Fracture Zones
- ++++ Railroad

## Warehouse Area Geology

### 3.3. SOILS

The soils beneath the site have been classified by the Navajo Army Depot Soil Survey, Coconino County, Arizona, as Soil Unit 10 (USDA 1970). These are moderately deep gravelly clay soils with a loam surface and usually have zero to five percent slopes. The surface soil is generally a brown granular loam, having a pH of 7.0 and a thickness of three to five inches. The subsoil is generally a dark reddish gray gravelly clay with a blocky structure, having a pH of 7.8 and a thickness of 20 to 30 inches. This type of soil comprises approximately five percent of Navajo Army Depot soils, which accounts for approximately 1,400 acres of land on the base.

Physical testing of the soil samples collected during this investigation showed moisture ranging from 6.4 percent up to 23.6 percent. Dry densities of the soils range from 84.2 pounds per cubic foot (pcf) up to 97.4 pcf. Grain size distributions ranged from 28 percent gravel, 19 percent sand, nine percent fines up to 57 percent gravel, 52 percent sand, and 45 percent fines. All physical analysis results are included in Appendix H.

### 3.4. HYDROGEOLOGY

Four water bearing zones have been identified within the upper 2000 feet beneath the warehouse area. The uppermost zone, which feeds the springs from which the base receives its water supply, exists in fractures in the bottom of the uppermost basalt flow. The bottom of this zone is marked by a 30 foot thick clay aquitard at a depth of 70 feet bgs. A second water bearing zone exists in fractures at the base of the second basalt flow and is bounded on the bottom by a second clay aquitard at a depth of 150 feet bgs. A third water bearing zone exists in a 50 foot thick deposit of stream gravels and volcanic cinder that directly overlies the Kaibab Formation at a depth of 350 feet bgs. The fourth water bearing zone is the regional aquifer in the Coconino and Supai Formations at a depth of about 1,300 feet bgs.

Ground water recharge to the various water bearing zones occurs along fractures in the basalt flows and through fractures in the underlying Kaibab limestone. The presence and lateral continuity of the aquitards suggests that downward migration does not occur homogeneously throughout the area but is limited to areas of fracturing and faulting. In addition, the existence of the water bearing zones within fractures in the basalt suggests that contaminant migration would not be predictable using standard hydrogeologic techniques. Thus, remediation of contaminants in the ground water within the basalt zones would be problematic.

No drilling was done as part of the investigation of Building 216. Ground water was not encountered during drilling at Building 218 directly west of the site. Laterally discontinuous perched ground water conditions may exist throughout the alluvium. Drilling northeast, southwest, and east of the site also identified perched ground water within fractures in the basalt overlying the Camp Navajo Clay. Deeper ground water is likely to be present at an approximate depth of 1,300 feet bgs. This is based on the

depth to the regional aquifer as measured in the deep water supply well 8,000 feet southwest of the site.

**3.5. GEOPHYSICAL SURVEY**

A line locating survey was conducted around and beneath the building to prevent accidental damage to buried utilities in the area during the field investigation. During this survey, all water supply lines and drain lines were identified and marked on the ground surface. No unknown utilities were identified during this survey. Geophysical survey results are included in Appendix D.

## SECTION 4

# NATURE AND EXTENT OF CONTAMINATION

---

The following section summarizes the nature and extent of contamination identified at Building 216. All soil gas results are located in Appendix F. All analytical results are tabulated by analysis method in Appendix G. Soil physical characteristics are in Appendix H. Appendix I includes copies of all laboratory reports for this site.

### 4.1. SOIL GAS

Soil gas samples collected from beneath and surrounding the location of Building 216 contained detectable concentrations of 10 compounds. The only significant detections (greater than one microgram per sorber, [µg/sorber]) of petroleum compounds was at SG34 (undecane at 1.44 µg/sorber). No significant detections of VOCs or SVOCs were at found at the site.

The compounds detected at less than significant concentrations were limited in distribution and did not show any definitive distribution pattern (Appendix F). Since the concentrations of petroleum hydrocarbons, VOCs, and SVOCs were low or nondetect, the three soils borings were converted to hand auger borings and sampled at 2.5 and 5 feet bgs. All hand auger samples were analyzed for metals, petroleum hydrocarbons, VOCs, and SVOCs.

The hand auger boring locations outside the building were moved to SG01, SG05, and SG20. To verify the nondetect results from these soil gas samples. Low concentration of petroleum hydrocarbons were detected in soil samples from these hand augers but were not identified in the soil gas samples. Three SVOCs were detected at low concentrations in a soil samples from HA04 but were not detected in the corresponding soil gas (SG01). Similarly, nine VOCs were detected at low concentrations in soil samples from HA04 and HA06 but were not identified in the corresponding soil gas sample (SG01 and SG20, respectively).

The three hand auger borings proposed within the building were relocated to SG26, SG30, and SG34 to verify the nondetected results from SG26 and SG30 and to

#### 4. Nature and Extent of Contamination

verify the petroleum detection at SG34. Low concentrations of petroleum hydrocarbons were confirmed in soil samples from hand auger HA03 (confirmation for SG34). Petroleum hydrocarbons also were detected at similar low concentrations in soil samples from hand augers HA01 and HA02 but were not identified in their corresponding soil gas sample (SG26 and SG30, respectively). Similarly, two SVOCs were detected at low concentrations in a soil sample from HA01 but were not detected in the corresponding soil gas sample (SG26).

##### 4.2. SURFACE SOILS

Concentrations of various metals occur naturally in soils. With the exception of cadmium, lead, and selenium, no metals were identified at concentrations above background in any of the surface soil samples collected at this site (Table 4-1). A concentration of cadmium was detected above background (1.5 mg/kg) in one surface soil sample (at 1.6 mg/kg). Concentrations of lead were detected above background (30 mg/kg) in six surface soil samples (up to 119 mg/kg) (Figure 4-1). These detections do not exceed any regulatory level and are likely to be the result of lead based paint from the building or lubricating oils dripping from the underbody of vehicles in this area. Concentrations of selenium were detected above background (0.8 mg/kg) in two surface soil samples (up to 1.4 mg/kg). All detected metals concentrations, except for arsenic and beryllium, were detected at concentrations less than the Arizona Department of Environmental Quality (ADEQ) nonresidential Health Based Guidance Levels (HBGL). Arsenic and beryllium were found at concentrations higher than the ADEQ nonresidential HBGLs, but the concentrations are within background ranges previously defined for the installation (Tetra Tech 1997b).

Background concentrations were established by statistical analysis of all samples collected at Camp Navajo. Outliers were identified during the analysis and were eliminated from the statistical test prior to determination of the background concentrations (Tetra Tech 1997b).

With the exception of TRPH, no concentrations of petroleum hydrocarbons were identified in any of the surface soil samples collected at this site (Table 4-2). Concentrations of TRPH were detected in 17 of 18 surface soil samples (up to 550 mg/kg) (Figure 4-2). The other detected petroleum hydrocarbon (Diesel Fuel #2) does not have a set HBGL but is detected at low concentrations (up to 120 mg/kg) and is evaluated in Section 5.

##### 4.3. SUBSURFACE SOILS

No concentrations of metals were identified in any of the subsurface soil samples collected at this site (Table 4-1). Arsenic and beryllium were found at concentrations higher than the ADEQ nonresidential HBGLs, but the concentrations are within background ranges previously defined for the installation (Tetra Tech 1997b).

**Table 4-1**  
**Building 216 Metals Results**  
 (Detections Only)

Sample ID	Sample Date	Depth	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Potassium	Selenium	Silver
	CRQL		0.5	2	0.2	0.2	0.5	0.5	0.2	500	0.5	0.5
	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
216-SS01S-01	9/25/95	1	< 0.6	100	0.51	0.42	20.2	18.3	0.052 <sup>J</sup>	1340	1.4	0.52 <sup>J</sup>
216-SS02S-01	9/25/95	1	1.3	78.7	0.41	0.22	12.7	41.8	< 0.033	809	0.48 <sup>J</sup>	< 0.1
216-SS03S-01	9/25/95	1	4.2	31.9	0.22	0.24	8.4	25	< 0.033	931	0.52 <sup>J</sup>	< 0.1
216-SS04S-01	9/25/95	1	1.4	60.6	0.3	0.8	22.7	119	< 0.033	772	< 0.3	< 0.1
216-SS05S-01	9/25/95	1	1.7	218 <sup>J</sup>	0.84	0.28 <sup>J</sup>	12 <sup>J</sup>	8.6 <sup>J</sup>	< 0.033	1220	0.55	< 0.1
216-SS06S-01	9/25/95	1	1	94.2	0.37	0.6	10.2	19.9	< 0.033	658	< 0.3	< 0.1
216-SS07S-01	9/25/95	1	1.5	113	0.56	1.6	11.1	49.8	< 0.033	871	< 0.3	< 0.1
216-SS08S-01	9/25/95	1	0.81	122	0.8	0.57	14.7	22.6	< 0.033	1130	< 0.3	0.15 <sup>J</sup>
216-SS09S-01	9/25/95	1	< 0.6	94.5	0.41 <sup>J</sup>	0.87	18.9	28.5	< 0.033	1120	< 0.6	< 0.2
216-SS10S-01	9/25/95	1	< 0.6	184 <sup>J</sup>	0.47	0.45	20.8	18.9 <sup>J</sup>	< 0.033	1560	1.3	< 0.2
216-SS11S-01	9/26/95	1	< 0.3	196	0.55	0.79	24.9	24.6	0.044 <sup>J</sup>	2220	< 0.3	0.19 <sup>J</sup>
216-SS12S-01	9/26/95	1	< 0.3	118	0.37	0.67	18.4	29.3	< 0.033	1580	< 0.3	0.14 <sup>J</sup>
216-SS13S-01	9/26/95	1	< 0.3	132	0.37	0.58	22.7	38.8	< 0.033	1570	< 0.3	0.17 <sup>J</sup>
216-SS14S-01	9/25/95	1	0.97	84.4 <sup>J</sup>	0.45	0.98 <sup>J</sup>	27.9 <sup>J</sup>	105 <sup>J</sup>	< 0.033	794	< 0.3	< 0.1
216-SS15S-01	9/25/95	1	< 0.3	84.4 <sup>J</sup>	0.32	0.86	19.1	47.5 <sup>J</sup>	< 0.033	1360	0.42 <sup>J</sup>	0.11 <sup>J</sup>
216-HA01S-01	4/21/96	0.5	1.2	94.5	0.52	<0.05	5.4	11.7	< 0.02	399 <sup>J</sup>	< 0.3	0.11 <sup>J</sup>
216-HA01S-02	4/21/96	2.5	3.9	394	1.5	<0.05	21.4	11.3	0.032 <sup>J</sup>	1530	< 0.3	0.19 <sup>J</sup>
216-HA01S-03	4/21/96	5	3.9	1080	1.7	<0.25	17.2	6.6	< 0.02	758 <sup>J</sup>	< 0.15	< 0.5
216-HA02S-01	4/20/96	0.5	2.1	57.4	0.28	<0.05	5.5	21.8	< 0.02	302 <sup>J</sup>	0.36 <sup>J</sup>	< 0.1
216-HA02S-02	4/20/96	2.5	5.5	301	1.3	<0.25	32.5 <sup>U</sup>	10.3	0.032 <sup>J</sup>	1150 <sup>J</sup>	< 0.15	< 0.5
216-HA03S-01	4/20/96	0.5	4.7	249	1.2	<0.25	19.6	8.5	0.03 <sup>J</sup>	1030 <sup>J</sup>	< 0.15	< 0.5
216-HA03S-02	4/20/96	2.5	5.2	768	1.4	<0.25	17.4	6.2	0.037 <sup>J</sup>	552 <sup>J</sup>	< 0.15	< 0.5
216-HA03S-03	4/20/96	5	3.5	311	1.9	0.34 <sup>J</sup>	21.4	8.9	0.044 <sup>J</sup>	1440	< 0.6	< 0.2
216-HA04S-01	4/20/96	2.5	2.5	273 <sup>J</sup>	0.75	<0.05	24.7 <sup>J</sup>	23.5 <sup>J</sup>	0.026 <sup>J</sup>	1000	< 0.3	0.17 <sup>J</sup>
216-HA05S-01	4/20/96	2.5	4.5	1380	1.5	<0.25	11.5	5	0.033 <sup>J</sup>	533 <sup>J</sup>	< 0.15	< 0.5
216-HA05S-02	4/20/96	5	5.3	371	1.5	<0.1	37.5	20.3	0.054 <sup>J</sup>	1760	< 0.6	< 0.2
216-HA06S-01	4/20/96	2.5	1.8 <sup>J</sup>	239 <sup>J</sup>	0.97	<0.1	19.3	14.4	0.027 <sup>J</sup>	825 <sup>J</sup>	< 0.6	< 0.2
216-HA06S-02	4/20/96	5	2.5	464	1.5	<0.15	28.7	12.6	0.032 <sup>J</sup>	1240 <sup>J</sup>	< 0.9	< 0.3
216-HA07S-01	4/20/96	2.5	3.8 <sup>J</sup>	408 <sup>J</sup>	1.5	<0.15	31.2	14.2	0.035 <sup>J</sup>	1340 <sup>J</sup>	< 0.9	< 0.3
216-HA07S-02	4/20/96	2.5	3.3	1050 <sup>J</sup>	1.2 <sup>J</sup>	<0.25	11.3 <sup>J</sup>	8.4 <sup>J</sup>	0.032 <sup>J</sup>	439 <sup>J</sup>	< 0.15	< 0.5

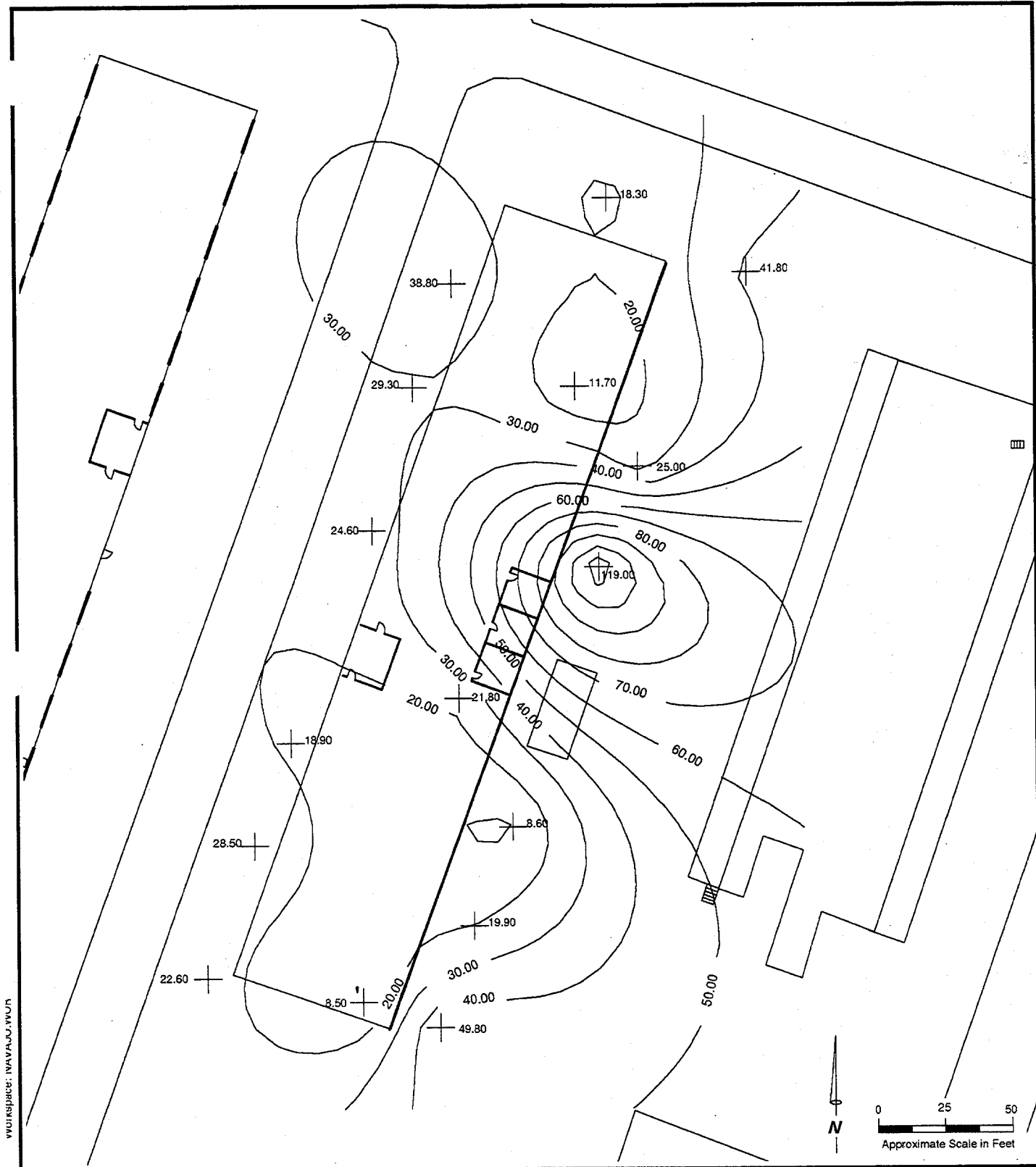
**Table 4-1**  
**Building 216 Metals Results**  
 (Detections Only) *(continued)*

Sample ID	Sample Date	Depth	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Potassium	Selenium	Silver
	CRQL		0.5	2	0.2	0.2	0.5	0.5	0.2	500	0.5	0.5
	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Analyses			30	30	30	30	30	30	30	30	30	30
Detections			23	30	30	16	30	30	14	30	7	9
Maximum Concentration			5.5	1380	1.9	1.6	37.5	119	0.054	2220	1.4	0.52
Arizona HBGL - Nonresidential			3.82	28700	1.34	244	5950	1400	123		2030	2030
Arizona HBGL - Nonresidential Hits			8	0	8	0	0	0	0		0	0
Maximum Background Concentration			44	1610	5	1.5	90	30	0.3	0	0.8	2.6
Background Hits			0	0	0	1	0	6	0	0	2	0

Notes:

CRQL Contract required quantitation limits  
 na not analyzed  
 < Less than the indicated detection limit  
 Data qualifiers are defined in Appendix G





## **Building 216 - Spray Paint Operations** **Lead Concentrations in Surface Soils**

Camp Navajo, Bellemont, Arizona

**Figure 4-1**

**Table 4-2**  
**Building 216 Petroleum Hydrocarbon Results**  
 (Detections Only)



Sample ID	Sample Date	Depth	TPH, Recoverable	Diesel Fuel #2
	CRQL		10	10
	Units		mg/kg	mg/kg
216-SS01S-01	9/25/95	1	48	< 0
216-SS02S-01	9/25/95	1	10 J	< 0
216-SS03S-01	9/25/95	1	550	< 0
216-SS04S-01	9/25/95	1	160	< 0
216-SS05S-01	9/25/95	1	11 J	< 0
216-SS06S-01	9/25/95	1	21	< 0
216-SS07S-01	9/25/95	1	100	< 0
216-SS08S-01	9/25/95	1	36	< 0
216-SS09S-01	9/25/95	1	24	< 0
216-SS10S-01	9/25/95	1	26	< 0
216-SS11S-01	9/26/95	1	26	< 0
216-SS12S-01	9/26/95	1	59	< 0
216-SS13S-01	9/26/95	1	28	< 0
216-SS14S-01	9/25/95	1	35 J	< 0
216-SS15S-01	9/25/95	1	40	< 0
216-HA01S-01	4/21/96	0.5	5.4 U	96 J
216-HA01S-02	4/21/96	2.5	3.6 U	11 J
216-HA01S-03	4/21/96	5	< 2	91 J
216-HA02S-01	4/20/96	0.5	4.8 U	120 J
216-HA02S-02	4/20/96	2.5	3.1 U	< 0
216-HA03S-01	4/20/96	0.5	< 2	< 0
216-HA03S-02	4/20/96	2.5	3 U	71 J
216-HA03S-03	4/20/96	5	3.2 U	< 0
216-HA04S-01	4/20/96	2.5	6 U	26 J
216-HA05S-01	4/20/96	2.5	3.1 U	< 0
216-HA05S-02	4/20/96	5	3.5 U	< 0
216-HA06S-01	4/20/96	2.5	93 J	< 0
216-HA06S-02	4/20/96	5	16	< 0
216-HA07S-01	4/20/96	2.5	17 J	< 0
216-HA07S-02	4/20/96	2.5	3.8 U	< 0
Analyses			30	30
Detections			28	6
Maximum Concentration			550	120
Arizona HBGL - Nonresidential				
Arizona HBGL - Nonresidential Hits				
Arizona HBGL - Residential			7000	
Arizona HBGL - Residential Hits			0	

## Notes:

CRQL Contract required quantitation limits  
 na not analyzed  
 < Less than the indicated detection limit  
 Data qualifiers are defined in Appendix G



Legend:

-  Drain
-  All concentrations in parts per million (ppm)

## **Building 216 - Spray Paint Operations** **Petroleum Hydrocarbon Concentrations in Surface Soils**

Background concentrations were established by statistical analysis of all samples collected at Camp Navajo. Outliers were identified during the analysis and were eliminated from the statistical test prior to determination of the background concentrations (Tetra Tech 1997b).

Three SVOCs were identified in subsurface soil samples collected from around and beneath the building (Table 4-3). Two SVOCs (fluoranthene and pyrene) were identified at concentrations below ADEQ nonresidential HBGLs and thus are not considered to be contaminants of concern. The other detected SVOC (phenanthrene) does not have a set HBGL but was detected at very low concentration ( at 0.036 mg/kg) and is evaluated in Section 5.

Nine VOCs were identified in subsurface soil samples collected from around and beneath the building (Table 4-4). Three VOCs (ethylbenzene, m- & p-xylene, and naphthalene) were identified at concentrations below ADEQ nonresidential HBGLs and thus are not considered to be contaminants of concern. The other six detected SVOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, isopropyltoluene, n-butylbenzene, n-propyl benzene, and tert-butylbenzene) do not have set HBGLs but were detected at very low concentrations (0.0012 mg/kg, 0.00066 mg/kg, 0.00059 mg/kg, 0.0004 mg/kg, and 0.00048 mg/kg, respectively) and are evaluated in Section 5.

#### 4.4. QA/QC

All samples were sent to Quanterra Incorporated (Quanterra) of Santa Ana, California for inorganic and organic parameter analyses. Temperature blanks for all coolers forwarded to the laboratory were within an acceptable range and all coolers arrived with custody seals intact. Applicable holding times were met for all analyses. Four field duplicate samples, including two surface soil (SS) and two subsurface soil (HA) samples, were collected at the site during the investigation, as shown below. Validation of the data was conducted by Laboratory Data Consultants, Inc., (LDC) of Carlsbad, California.

- 216-SS14S-01 blind duplicate of 216-SS05S-01;
- 216-SS15S-01 blind duplicate of 216-SS10S-01;
- 216-HA07S-01 blind duplicate of 216-HA06S-01; and,
- 216-HA07S-02 blind duplicate of 216-HA04S-01.

General validation findings applicable to both inorganic and organic data resulted in the qualification of select compound concentrations located above the method detection limit but below the respective sample quantitation limit prior to dilution and percent moisture corrections. These reported values are considered to be qualitatively acceptable but quantitatively estimated due to uncertainties in analytical precision near the limit of detection. According to USEPA guidelines, however, these low concentration data are considered suitable for risk evaluation applications with appropriate recognition of the noted quantitative uncertainties.

**Table 4-3**  
**Building 216 Semivolatile Organic Compound Results**  
 (Detections Only)

Sample ID	Sample Date	Depth	Fluoranthene	Phenanthrene	Pyrene
	CRQL		0.33	0.33	0.33
	Units		mg/kg	mg/kg	mg/kg
216-HA04S-01	4/20/96	2.5	0.14 <sup>J</sup>	0.036 <sup>J</sup>	0.14 <sup>J</sup>
Analyses			12	12	12
Detections			1	1	1
Maximum Concentration			0.14	0.036	0.14
Arizona HBGL - Nonresidential			16450		12250
Arizona HBGL - Nonresidential Hits			0		0

## Notes:

CRQL      Contract required quantitation limits  
 na        not analyzed  
 <        Less than the indicated detection limit  
 Data qualifiers are defined in Appendix G

**Table 4-4**  
**Building 216 Volatile Organic Compound Results**  
 (Detections Only)

Sample ID	Sample Date	Depth	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Ethylbenzene	Isopropyltoluene	m- & p-Xylene(s)	n-Butylbenzene	n-Propylbenzene	Naphthalene	tert-Butylbenzene
	CRQL		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
216-HA01S-03	4/21/96	5	0.00031 <sup>J</sup>	0.00035 <sup>J</sup>	0.00033 <sup>J</sup>	<0.00037	<0.00054	<0.00035	0.0003 <sup>J</sup>	<0.00024	<0.00028
216-HA04S-01	4/20/96	2.5	0.00055 <sup>J</sup>	<0.00018	0.00029 <sup>J</sup>	<0.00037	<0.00054	<0.00035	<0.00023	<0.00024	<0.00028
216-HA07S-01	4/20/96	2.5	0.0012 <sup>J</sup>	0.00066 <sup>J</sup>	<0.00024	0.00051 <sup>U</sup>	0.0008 <sup>J</sup>	0.00059 <sup>J</sup>	0.0004 <sup>J</sup>	0.00044 <sup>J</sup>	0.00048 <sup>J</sup>
Analyses			12	12	12	12	12	12	12	12	12
Detections			3	2	2	1	1	1	2	1	1
Maximum Concentration			0.0012	0.00066	0.00033	0.00051	0.0008	0.00059	0.0004	0.00044	0.00048
Arizona HBGL - Nonresidential					42000		805000			16450	
Arizona HBGL - Nonresidential Hits					0		0			0	

## Notes:

CRQL Contract required quantitation limits  
 na not analyzed  
 < Less than the indicated detection limit  
 Data qualifiers are defined in Appendix G

***Total Recoverable Petroleum Hydrocarbons by ADHS Method BLS-418.1AZ***

Evaluation of field duplicate results for TRPH analyses indicated general quantitative agreement between reported results. RPDs for the subsurface field duplicate pairs were all within QC acceptance criteria while one of the two surface soil duplicate pairs had an RPD outside criteria. Associated data for these samples were flagged as quantitatively estimated. However, because of the generalized and non-definitive chromatographic patterns produced by TRPH analyses, precise comparative measurement among any field samples is extremely difficult. Secondly, the reported incident of imprecision also may be attributed to the high clay content and typical heterogeneity of soils in the Camp Navajo area. Since affected results were all significantly below applicable health-based action levels, no overall impact on data useability for risk evaluation purposes is expected.

Results of the validation performed by LDC indicated potential quantitative uncertainties in select TRPH results as based on matrix spike/matrix spike duplicate (MS/MSD) results exceeding QC acceptance criteria. These deviations were attributed to sample heterogeneity and matrix interferences by the laboratory. In addition, all associated laboratory control sample and duplicate control sample recoveries were within applicable QC criteria. Consequently, all TRPH results flagged as quantitatively estimated are considered qualitatively valid and according to USEPA guidelines, considered useable for risk evaluation purposes.

Additional validation findings indicated trace TRPH contamination in select analytical method blanks. Although the concentrations observed in the method blanks were less than one-half of the respective sample quantitation limits, low-level TRPH results in associated field samples were qualified as non-detected and considered to be useable for risk evaluation purposes at the adjusted reporting limits. All other TRPH data for submitted samples were determined to be valid without qualification and considered useable for all purposes.

***Total Extractable Petroleum Hydrocarbons by ADHS Method BLS-191***

Evaluation of field duplicate results for total extractable petroleum hydrocarbon (TEPH) analyses also indicated general quantitative agreement between reported results. All RPDs were within QC acceptance criteria with exception of field duplicates whose RPDs incorporated nondetect concentrations into their precision calculations. As noted prior, reported incidents of imprecision may be attributable to the high clay content and typical heterogeneity of soils in the Camp Navajo area. Although associated data for these samples were flagged as quantitatively estimated, no significant adverse effects on overall TEPH data quality are expected.

Validation of TEPH results also indicated qualitative uncertainties associated with identification of the reported hydrocarbon species. Quantification of reported TEPH results was accomplished using diesel fuel reference standards since chromatographic profiles obtained from the sample analyses were not consistent with patterns observed

from known hydrocarbon reference standards. Due to both the default application of diesel fuel reference factors and the high degree of uncertainty in the petroleum hydrocarbon identifications, the resulting TEPH values are considered quantitatively estimated and reported as “unknown hydrocarbons.”

All other TEPH data for submitted samples were determined to be valid without qualification and considered useable for all purposes.

***Volatile Organic Compounds by USEPA Method 8260A and Semivolatile Organic Compounds by USEPA Method 8270B***

Evaluation of field duplicate results for VOC and SVOC analyses indicated excellent qualitative and quantitative agreement between reported results. All analytical values reported for the field duplicate pairs were below the respective sample quantitation limits and hence, all VOC/SVOC duplicate results are considered acceptable.

Results of the validation indicated potential quantitative uncertainties in several nondetect VOC/SVOC results based on calibration parameters exceeding data assessment QC criteria. All affected analytes had no calibration specifications required by the method. In addition, all associated MS/MSD and laboratory control samples had acceptable recoveries within QC criteria. Consequently, all nondetect VOC/SVOC results flagged as quantitatively estimated are considered both valid and useable for risk evaluation purposes according to USEPA guidelines.

All other VOC/SVOC data for submitted samples were determined to be valid without qualification and considered useable for all purposes.

***Metals by USEPA Methods 6010A and 7471A***

Evaluation of field duplicate results for metals analyses indicated general qualitative and quantitative agreement between reported results. All RPDs were within QC acceptance criteria with the exception of field duplicates whose RPDs incorporated either nondetect or trace element concentrations into their precision calculations. In addition, several elements with concentrations exceedingly greater than the respective sample quantitation limits also had RPDs outside of QC acceptance criteria. These incidents of imprecision were attributed by the laboratory to the significant complexity and heterogeneity of the sample matrix. Although associated data for these samples were flagged as quantitatively estimated, no significant adverse effects on overall data quality are expected.

Validation findings also suggested the potential for quantitative uncertainties in arsenic and chromium results for several field samples based on duplicate sample analyses exceeding QC acceptance criteria for precision. These deviations were attributed to sample matrix interferences by the laboratory and applicable metals data have been flagged as quantitatively estimated. However, all affected results were associated with acceptable QC sample recoveries and involved either trace or low-level sample



concentrations significantly below respective health-based action levels. Therefore, no restrictions on data useability for risk evaluation applications are expected.

Additional validation findings indicated trace metals contamination in several analytical method blanks. Although the concentrations observed in the method blanks were less than one-half of the respective sample quantitation limits, low-level metals results in associated field samples were qualified as non-detected and considered to be useable for risk evaluation purposes at the adjusted reporting limits. All other metals data for submitted samples were determined to be valid without qualification and considered useable for all purposes.

## SECTION 5

# RISK SCREENING

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Current activities and activity patterns at the site are considered part-time commercial/industrial, as are the documented uses of land surrounding the site. Therefore, for purposes of this risk screening, land use of the site is assumed to be industrial. Previous operations at the site have indicated inorganic metal compounds, petroleum hydrocarbons, and both volatile and semivolatile organic compounds to be the principal chemicals of concern (COCs) posing a potential exposure risk to workers involved in commercial/industrial activities onsite.

### ***Inorganic Contaminants***

Based on maximum reported concentrations, the only metals with detectable levels greater than the corresponding HBGLs developed by the Arizona Department of Health Services (ADHS) for ADEQ using nonresidential exposure assumptions were arsenic and beryllium. Potassium was eliminated from the risk screening based on its relative low toxicity and because its maximum reported concentration was less than the USEPA ceiling limit of  $1 \times 10^{-5}$  mg/kg reserved for “less toxic inorganic contaminants.”

Maximum concentrations for arsenic (5.5 mg/kg) and beryllium (1.9 mg/kg) were observed to marginally exceed current HBGLs for nonresidential soils (3.82 mg/kg and 1.34 mg/kg, respectively) as well as current USEPA Region IX Preliminary Remediation Goals (PRGs) for industrial soils (2.4 mg/kg and 1.1 mg/kg, respectively). Data reported for both elements also indicated that the highest concentrations generally were distributed in subsurface rather than surface soils at the site. However, from a quantitative risk screening perspective using USEPA “total risk” criteria, reported soil concentrations are considered to reside within an acceptable range of both health-based standards under expected part-time occupational exposure conditions.

In addition, the maximum concentrations of arsenic and beryllium in both surface and subsurface soils were below naturally occurring background levels recorded for the

geographical area encompassing the Camp Navajo base. Background concentration levels of 44 mg/kg for arsenic and 5.0 mg/kg for beryllium (Tetra Tech 1997b) indicate that the reported soil results are consistent with regional conditions. According to both USEPA and USACE guidelines, if inorganic chemicals are detected at the site at naturally occurring concentrations, they may be eliminated from the corresponding risk evaluation.

Moreover, soil concentrations of both arsenic and beryllium detected onsite were reviewed and found to be significantly below all corresponding soil screening levels (SSLs) promulgated by USEPA Region III (380 mg/kg and 690 mg/kg, respectively) for estimating the intermedia transfer potential of contaminants. SSLs are intended to “provide reasonable maximum estimates of transfers of contaminants from soils to other media,” including air, using residential contact scenarios. Assuming the potential for dispersion of entrained particles and fugitive dust onsite, the relative risks posed by arsenic and beryllium concentrations at the site are expected to be minimal and within acceptable SSLs standards established by USEPA for commercial/industrial scenarios.

### ***Organic Contaminants***

Laboratory results for organic COCs also show that maximum reported soil concentrations are below the respective non-residential HBGLs in all situations where HBGLs have been developed. For compounds without HBGLs established, reported concentrations were evaluated according to current USACE and USEPA risk assessment guidance on each chemical class of compound. Petroleum hydrocarbon results were excluded from COC consideration since they are not indicated to contain concentrations high enough to pose a potential exposure risk or health threat during onsite commercial/industrial activities using both ADEQ and USEPA guidelines.

The seven VOCs with detectable trace concentrations but no current non-residential HBGLs or industrial PRGs are all alkylated benzenes, a hydrocarbon group that includes the trimethylbenzenes and butylated benzenes. The low-level detection (0.00051 mg/kg) of isopropyltoluene in the subsurface soil was determined during validation to be potentially biased by laboratory method blank contamination. Hence, this compound was qualified as nondetect at an elevated reporting limit and subsequently eliminated as a site COC since the adjusted reporting limit was significantly below applicable health-based action levels.

The maximum reported soil concentration for the remaining group of six detected VOCs was 0.0012 mg/kg for 1,2,4-trimethylbenzene. All other results for VOCs without current nonresidential HBGLs were below the part-per-billion (ppb or µg/Kg) level with low frequencies of detection. Because the maximum concentrations for these VOCs were also all considerably less than the current nonresidential HBGL established for benzene (197 mg/kg), a member of this chemical class but with significantly higher volatilization and toxicological properties, trace VOC levels for the

six reported alkylated benzenes would not be expected to constitute a health hazard in a commercial/industrial setting.

The three SVOCs detected in the subsurface soil were fluoranthene, phenanthrene and pyrene, all polynuclear aromatic hydrocarbons (PAHs). These compounds were each detected only once during the investigation and at trace concentrations deemed “quantitatively estimated.” Since the maximum soil concentration reported for both fluoranthene and pyrene (0.14 mg/kg) was significantly below the current nonresidential HBGLs established for these two compounds (16,450 mg/kg and 12,250 mg/kg, respectively), fluoranthene and pyrene were eliminated as COCs at the site based on soil concentration levels below health-based standards established by ADEQ for nonresidential exposure settings.

For phenanthrene, a compound without a current nonresidential HBGL or industrial PRG developed, the maximum reported soil concentration (0.036 mg/kg) was considerably less than the nonresidential HBGL established for benzo(a)pyrene (0.8 mg/kg), a member of the same chemical class but with significantly higher toxicological properties and the standard for comparative toxicity among carcinogenic PAHs according to USEPA. Therefore, trace phenanthrene levels in the subsurface soil would not be expected to constitute a health hazard during onsite commercial/industrial activities.

## SECTION 6

# SUMMARY AND CONCLUSIONS

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### 6.1. SUMMARY

No contamination has been identified above action levels at Building 216. Detected concentrations of contaminants do not exceed either health based guidance levels or risk based concentrations of concern.

Results of the overall risk screening indicate that the maximum reported concentrations of identified contaminants in soils at the site would not be expected to result in adverse health effects relevant to commercial/industrial land use. This determination incorporates the most current ADHS, USEPA and USACE “acceptable” target risk criteria into its approach and is intended to be a “health-conservative” evaluation of potential risk and hazard.

### 6.2. CONCLUSIONS

All data collected during this investigation meet acceptable QA/QC standards and are considered to be representative of site conditions. Therefore, based on the lack of detected contamination exceeding either HBGLs or risk screening levels, no further action is warranted. This site has been closed by the Arizona Department of Environmental Quality. A copy of the closure letter is included in Appendix L.

## SECTION 7

## REFERENCES

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**APPENDIX A**  
**PHOTO DOCUMENTATION**



### **Photos Building 216**

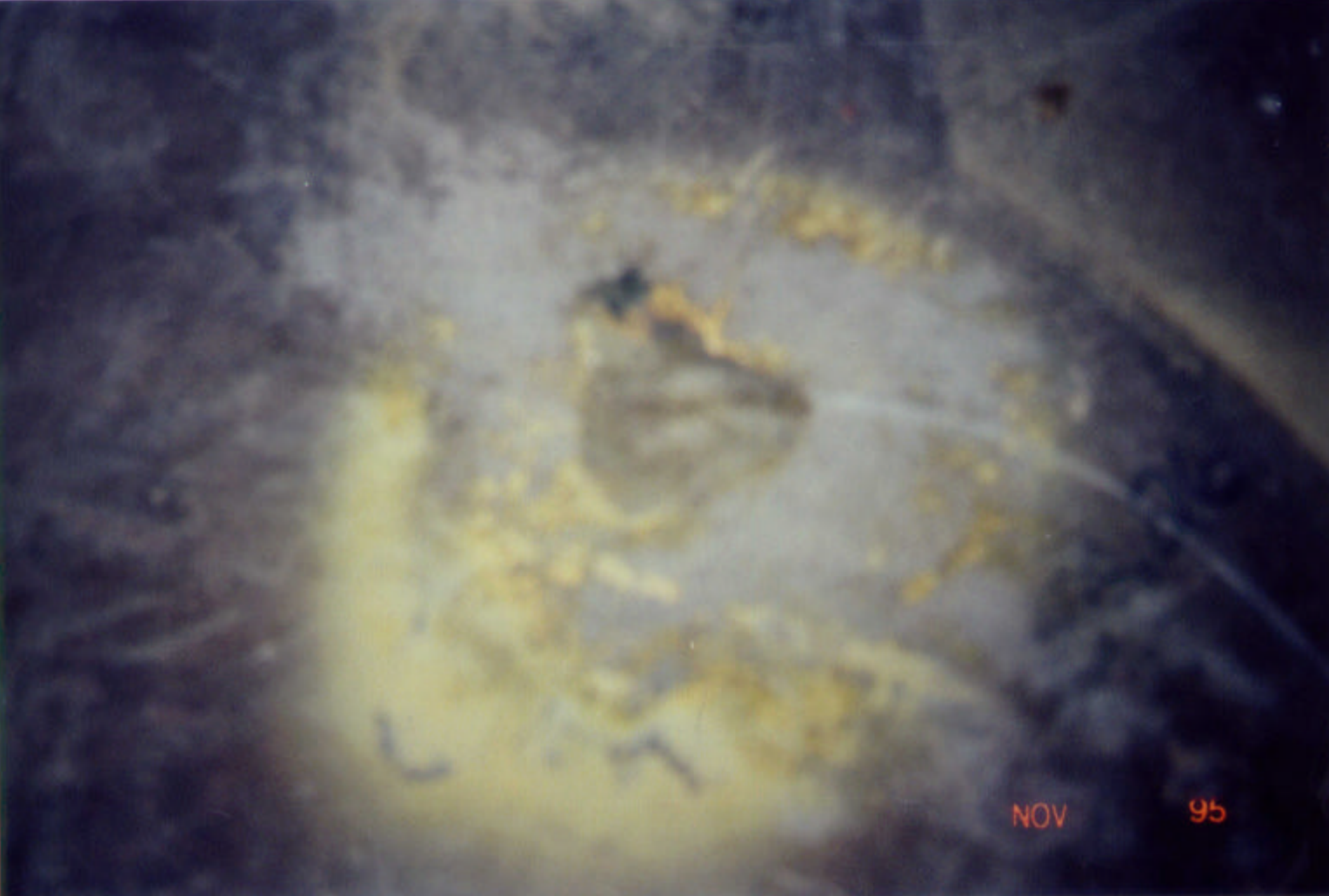
4-19 Bldg 216, S., 7/23/94, by Brad Hall

39-23 Patched and sanded hole @ Bldg 216, 11/21/95, by Dave Wrzosek

39-24 Patched and sanded hole @ Bldg 216, 11/21/95, by Dave Wrzosek

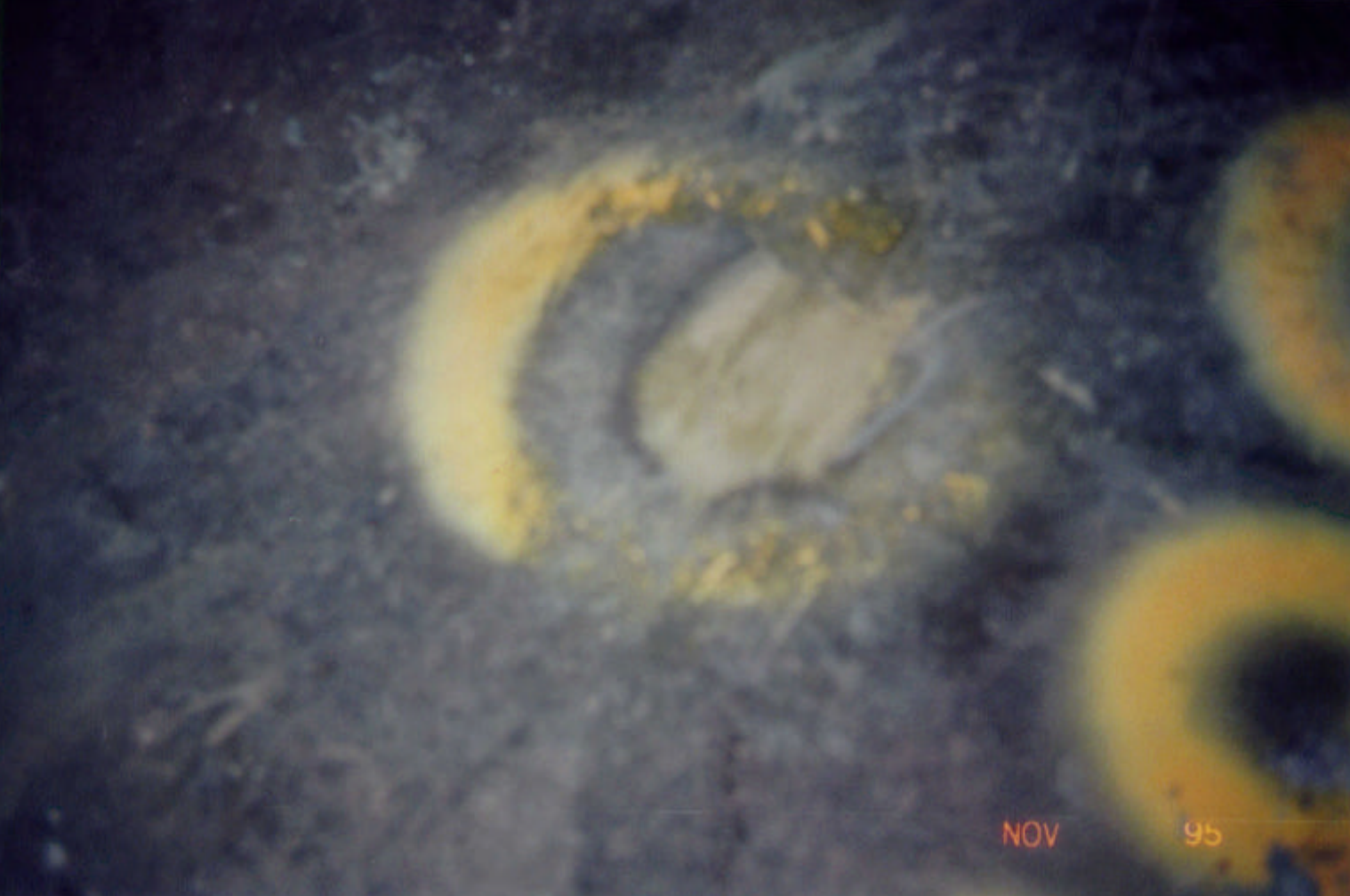
39-25 Patched and sanded hole @ Bldg 216, 11/21/95, by Dave Wrzosek





NOV

95



NOV

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## **APPENDIX B**

### **FIELD NOTES**

**APPENDIX C**  
STANDARD OPERATING PROCEDURES

# SECTION 1

## PASSIVE SOIL GAS SURVEY

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### 1.1 PURPOSE

The purpose of this standard operating procedure (SOP) is to describe the considerations and procedures for conducting a passive soil gas survey. Soil gas will be used as a reconnaissance screening tool to identify volatile and semivolatile contaminants in subsurface soils. Such contaminants migrate at different rates through porous media depending on the permeability of the media, the concentration gradient, and the moisture content. Soil gas can be used to determine the presence and distribution of volatile and semivolatile contaminants. Relatively high concentrations of volatile constituents in the soil atmosphere does not necessarily indicate the presence of similarly high levels of contaminants in the liquid or solid phase, however.

### 1.2 TECHNIQUE - DESCRIPTION

Soil-gas samplers will be located as described in the site-specific sampling plans. Both deterministic and probabilistic sampling methods will be employed, depending on site-specific conditions and objectives. Probabilistic sampling will be used in areas in which there is little or no information to inform the sampling effort and where potential sampling locations are not constrained. Probabilistic sampling will be based on systematic sampling of a hexagonal grid. The sampling grid may be stratified to focus on certain portions of the site where greater detail is needed. Deterministic sampling will be carried out at sites where there is enough information available to limit the soil gas study to selected portions of the site or where site features limit the choice of sampling locations. For example, soil gas surveys around buildings may be confined to locations between the building perimeter and the adjacent railroad track in order to preferentially sample the area where most spills are likely to have occurred.

#### 1.2.1 Description of Methods

The “passive” soil gas method refers to a sorbent-filled sampler that is installed in the shallow subsurface for a specified time to allow the surrounding vapor-filled atmosphere to migrate into the sampler and be partitioned to the sorbent. The



sampler does not rely on pumping soil vapor into the sampler or through a canister. The sampler is made of a semi-permeable membrane that repels water but allows vapor molecules to enter by diffusion. The sorbent inside the sampler has a high solid-vapor partitioning coefficient and a high sorption capacity such that the concentration gradient is in the direction of the screening module.

The depth of installation of soil gas probes will be three feet below the ground surface to identify evidence of contaminants that originated primarily from surface spills. Deeper installations may be justified if the source of the contamination is below a capping layer that would hinder detection of the contaminant at the three-foot depth.

As vapor diffuses in the soil atmosphere, it enters the sampler and sorbs strongly to the sorbent. The concentration of contaminant molecules in the soil atmosphere is a function of the volatility of the compound, the concentration of the compound in the liquid or solid phase, temperature, humidity, and, to some extent, the concentrations of other compounds.

The sorbent mixture absorbs almost all volatile and semivolatile organic compounds. If the compounds are present in the liquid or solid phase, then equilibrium partitioning between phases ensures that at least some contaminant molecules will be present in the soil atmosphere and will inevitably migrate toward, and be trapped on, the sorbent in the sampler.

## **1.3 PROCEDURES**

### **1.3.1 Underground Utility Clearance**

Prior to selecting sample locations, an underground utility search is recommended. The local utility companies can be contacted and requested to mark the locations of their underground lines. Sampling plans can then be drawn up accordingly. Each sample location should also be screened with a metal detector or magnetometer to verify that no underground pipes or drums exist.

### **1.3.2 Method and Equipment**

#### ***GORE-SORBER<sup>sm</sup>***

GORE-SORBER<sup>sm</sup> screening modules will be used for soil gas testing. The screening modules are made of a semi-permeable membrane that repels water but allows vapor molecules to enter by diffusion. The sorbent inside the sampler has a high solid-vapor partitioning coefficient and a high sorption capacity such that the concentration gradient is in the direction of the screening module. The sampling person marks a location on the ground using a flag or spray paint and uses a slide hammer and a tile probe or an electric drill to make a one-inch hole to a depth of two to three feet. While wearing clean nitrile gloves, the sampler removes the module from its sealed container. The module is then lowered into the hole with a stainless steel rod inserted into the pocket in the bottom of the module. Replicate sorbers are housed in the

bottom of an length of sealed PTFE tubing. The module is placed to the bottom of the hole. When the module is inserted the full depth of the hole, it is pressed against the side of the hole and the rod twisted until the rod is freed and pulled out. A cork attached to the top of the module is inserted into the hole to prevent rain or atmospheric gases from entering the module and to facilitate retrieval. The auger and stainless steel rod are decontaminated as described in the Decontamination of Field Equipment SOP.

The modules are left in the ground for 14 days and then are retrieved for analysis.

The outer length of tubing is used to insert and retrieve the module. To retrieve the module, the stopper and module are pulled out of the ground. The stopper then is cut off and discarded.

The sampling person records the following information in the field logbook:

- The unique serial number on the top of the sorber container and on a metal identification tag connected to the screening module;
- The depth of the installation;
- The location identification number;
- The date and time, remarks or observations; and
- The sampler's initials.

The sampling person fills out a field tracking form when the sample is collected. The sorber container tag number, the location number, the depth, date and time of collection, number of replicates, remarks, and observations are recorded on the form. The sampling person relinquishes the samples by signing and dating the form, and the field sample control manager signs to accept the samples. The field sample control manager then transfers the information on the field sample tracking report form to a chain-of-custody form and enters the analytical methods requested.

### **1.3.3 Sample Containers and Preservation Techniques**

The module and metal tag identification are to be placed back into the labeled vial which is then sealed. The samples are packed in a cooler containing ice at a temperature of 4°C and shipped to the laboratory.

### **1.3.4 Field Quality Control Sampling Procedures**

There are no specific quality assurance activities which apply to the implementation of these procedures. However, the following general QA procedures apply:

- All data must be documented on field data sheets or within site logbooks.
- All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior and after sampling/operation and they must be documented.

**1.3.5 Decontamination Procedures**

All sampling equipment will be properly decontaminated as outlined in the SOP for Decontamination of Field Equipment.

## SECTION 2

# SURFACE-SOIL SAMPLING

---

### 2.1 PURPOSE

The purpose of this standard operating procedure (SOP) is to describe the considerations and procedures for collecting representative surface samples. Analysis of surface samples can determine whether concentrations of specific surface pollutants exceed established action levels, and if the concentrations of soil pollutants present a risk to public health, welfare, or the environment.

Materials exposed on the land surface, including soils, sediments, and wastes, are subject to disturbance by weather conditions, vehicle traffic, bioturbation, and other effects. Because volatile contaminants are unlikely to be present in surficial materials, it generally is not necessary to obtain undisturbed samples from the surface. An exception to is when surface samples are collected from beneath an impermeable surface, such as a road or building slab. Surface soils are typically very heterogeneous in compositions and texture, and chemical concentrations in surface soils may vary dramatically over short depth intervals. Often, the first few inches of soil contain gravel, vegetation, or debris. It is desirable to use a sampling method that reduces the impacts of these heterogeneities without biasing the results.

For surface-soil sampling, some judgment may be needed to identify the ground surface datum. The objective is to sample the soil matrix and avoid collecting rock and plant material to the extent possible. Vegetation will be moved aside, dense vegetative matting, detritus or roots will be removed, and gravel will be scraped away to expose the ground surface. Surface samples from beneath pavement or concrete slabs will be collected after first removing road base and gravel to expose the underlying soil. In some locations, such as in the basements of buildings, the ground surface will be below grade. In these cases, depth below grade will be measured and recorded.

**2.2 TECHNIQUE - DESCRIPTION**

Soil samples may be collected using a variety of methods and equipment. The methods and equipment used are dependent on the type of sample required (disturbed versus undisturbed) and the type of soil. Samples that do not need to be undisturbed may be easily sampled using a spade, trowel, or scoop. Collecting undisturbed samples may be performed using a hand-auger, a trier, or a split-spoon sampler.

**2.3 PROCEDURES****2.3.1 Preparation**

1. Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are required.
2. Obtain necessary sampling and air monitoring equipment.
3. Decontaminate or preclean equipment, and ensure that it is in working order.
4. Prepare schedules, and coordinate with staff, client, and regulatory agencies as appropriate.
5. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.
6. Use stakes, buoys, or flagging to identify and mark all sampling locations. Consider specific site factors, including extent and nature of contaminant, when selecting sample location. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions. All staked locations will be cleared for underground utilities by the property owner prior to soil sampling.

**2.3.2 Interferences and Potential Problems**

There are two primary interferences or potential problems associated with soil sampling. These are cross-contamination of samples and improper sample collection methods. Cross-contamination can be eliminated or minimized through the use of sampling equipment dedicated to each sample location. If this is not possible or practical, then decontamination of sampling equipment is necessary. Improper sample collection methods include using contaminated sampling equipment, disturbing of the matrix causing in compaction of the sample, or inadequate homogenizing of the samples where required, which results in variable, non-representative analytical results.

**2.3.3 Sampling Considerations**

This method can be used in most soil types. Surface soil samples may be collected with spades, shovels, or scoops. Surface material can be removed to the required

depth with this equipment, then a stainless steel or plastic scoop can be used to collect the sample.

Accurate, representative samples can be collected with this procedure depending on the care and precision taken. A flat, pointed mason trowel can be used to cut a block of the desired soil when undisturbed profiles are required. A stainless steel scoop, lab spoon, or plastic spoon will suffice in most other cases. Avoid the use of devices plated with chrome or other materials. Plating is particularly common with garden implements such as potting trowels.

Follow these procedures to collect surface-soil samples.

1. Carefully remove the top layer of soil or debris to the desired sample depth with a pre-cleaned spade.
2. Using a pre-cleaned, stainless-steel scoop, plastic spoon, or trowel, remove and discard a thin layer of soil from the area which came in contact with the spade.
3. If the sample is to be analyzed for volatile organics, volatile organic analysis is to be performed, transfer a portion of the sample directly into an appropriate, labeled sample container(s) with a stainless-steel lab spoon, plastic lab spoon, or equivalent and secure the cap(s) tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogeneous sample representative of the entire sampling interval. Then, place the sample into an appropriate, labeled container(s) and secure the cap(s) tightly.

#### **2.3.4 Sample Containers and Preservation Techniques**

In order to ensure proper sample preservation, samples should be refrigerated to 9°C or less and holding time should be kept to a minimum.

#### **2.3.5 Field Quality Control Sampling Procedures**

There are no specific quality-assurance activities which apply to the implementation of these procedures. However, the following general QA procedures apply:

- All data must be documented on field data sheets or within site logbooks.
- All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior and after sampling/operation and they must be documented.

#### **2.3.6 Decontamination Procedures**

All sample equipment that comes into contact with soil or water must be decontaminated prior to sampling. Decontamination procedures for sampling equipment are described in the Decontamination of Field Equipment SOP.

## **SECTION 3**

# **SHALLOW SUBSURFACE-SOIL SAMPLING**

---

### **3.1 PURPOSE**

The purpose of this standard operating procedure (SOP) is to describe the considerations and procedures for collecting representative shallow subsurface soil samples. Analysis of shallow subsurface samples can determine whether concentrations of specific subsurface pollutants exceed established action levels, and if the concentrations of soil pollutants present a risk to public health, welfare, or the environment.

Because volatile contaminants are likely to be present in subsurface materials, it generally is necessary to obtain undisturbed samples from the subsurface. Subsurface soils are typically very heterogeneous in compositions and texture, and chemical concentrations in subsurface soils may vary dramatically over short depth intervals.

### **3.2 TECHNIQUE - DESCRIPTION**

Subsurface soil samples may be collected using a variety of methods and equipment. The methods and equipment used are dependent on the depth of the desired sample, the type of sample required (disturbed versus undisturbed), and the type of soil. Near-surface soils may be easily sampled using a spade, trowel, or scoop. Sampling at greater depths may be performed using a hand-auger, a trier, a split-spoon sampler, or, if required, a backhoe.

### **3.3 PROCEDURES**

#### **3.3.1 Preparation**

1. Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are required.
2. Obtain necessary sampling and air monitoring equipment.
3. Decontaminate or preclean equipment, and ensure that it is in working order.



4. Prepare schedules, and coordinate with staff, client, and regulatory agencies as appropriate.
5. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.
6. Use stakes, buoys, or flagging to identify and mark all sampling locations. Consider specific site factors, including extent and nature of contaminant, when selecting sample location. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions. All staked locations will be cleared for underground utilities by the property owner prior to soil sampling.

### **3.3.2 Interferences and Potential Problems**

There are two primary interferences or potential problems associated with subsurface soil sampling. These are cross-contamination of samples and improper sample collection methods. Cross-contamination can be eliminated or minimized through the use of sampling equipment dedicated to each sample location. If this is not possible or practical, then decontamination of sampling equipment is necessary. Improper sample collection methods include using contaminated sampling equipment, disturbing of the matrix causing in compaction of the sample, or inadequate homogenizing of the samples where required, which results in variable, non-representative analytical results.

### **3.3.3 Sampling Considerations**

#### ***Sampling at Depth with Augers and Thin-Wall Tube Samplers***

This system consists of an auger, a series of handle extensions to allow sampling at depth, a “T” handle, and a thin-wall tube sampler. The auger is used to bore a hole to a desired sampling depth, and is then withdrawn. The sample may be collected directly from the auger. If a core sample is to be collected, the auger tip is then replaced with a thin-wall tube sampler. The sampler is then lowered down the borehole and driven into the soil at the completion depth. The sampler is then withdrawn and the core removed.

Several types of augers are available. These include: bucket, continuous flight (screw), and posthole augers. Bucket augers are better for direct sample recovery since they can remove a large volume of sample in a short time. When continuous flight augers are used, the sample can be collected directly from the auger flights. Sampling from continuous flight augers is satisfactory when a composite of the complete soil column is desired. Posthole augers have limited utility for sample collection.

Follow these procedures for collecting subsurface soil samples with the auger and a thin-wall tube sampler.

1. Attach the auger bit to a drill rod extension, and attach the “T” handle to the drill.
2. Clear the area to be sampled of any surface debris (e.g. twigs, rocks, litter). It may be advisable to remove the first 3 to 6 inches of surface soil for an area approximately 6 inches in radius around the drilling location.
3. Begin augering, periodically removing and depositing accumulated soils onto a plastic sheet spread near the hole. This helps prevent accidental brushing of loose material back down the borehole when removing the auger or adding extensions. It also facilitates refilling the hole, and avoids possible contamination of the surrounding area.
4. After reaching the desired depth, slowly and carefully remove the auger from boring. When sampling directly from the auger, collect sample after the auger is removed from boring and proceed to step 10.
5. Remove auger tip from drill rods and replace with a pre-cleaned thin-wall tube sampler. Install proper cutting tip.
6. Carefully lower the tube sampler down the borehole. Gradually force the tube sampler into the soil. Care should be taken to avoid scraping the borehole sides. Avoid hammering the drill rods to facilitate coring as the vibrations may cause the boring walls to collapse.
7. Remove the tube sampler, and unscrew the drill rods.
8. Remove the cutting tip and the core from the device.
9. Discard the top of the core (approximately 1 inch), as this represents material collected before penetration of the layer of concern. Place the remaining core into the appropriate labeled sample container(s). Sample homogenization is not required.
10. If volatile organic analysis is to be performed, transfer portion of the sample directly into an appropriate, labeled container(s) with a stainless steel lab spoon, plastic lab spoon, or equivalent and secure the cap(s) tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogeneous sample representative of the entire sampling interval. Then, place the sample into an appropriate, labeled container(s) and secure the cap(s) tightly.
11. If another sample is to be collected in the same hole, but at a greater depth, reattach the auger bit to the drill and assembly, and follow steps 3 through 11, making sure to decontaminate the auger and tube sampler between samples.

12. Abandon the hole according to applicable state regulations. Generally, shallow holes can simply be backfilled with the removed soil material.

#### ***Sampling at Depth with a Trier***

The system consists of a trier, and a “T” handle. The auger is driven into the soil to be sampled and used to extract a core sample from the appropriate depth.

Follow these procedures to collect subsurface soil samples with a sampling trier.

1. Insert the trier into the material to be sampled at a 0° to 45° angle from horizontal. This orientation minimizes the spillage of sample.
2. Rotate the trier once or twice to cut a core of material.
3. Slowly withdraw the trier, making sure that the slot is facing upward.
4. If volatile organic analysis is to be performed, transfer portion of the sample directly into an appropriate, labeled container(s) with a stainless steel lab spoon, plastic lab spoon, or equivalent and secure the cap(s) tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogeneous sample representative of the entire sampling interval. Then, place the sample into an appropriate, labeled container(s) and secure the cap(s) tightly.

#### ***Sampling at Depth with a Split-Spoon Sampler***

The procedure for split-spoon sampling describes the collection and extraction of undisturbed soil cores of 18 or 24 inches in length. A series of consecutive cores may be extracted with a split spoon sampler to give a complete soil column profile, or an auger may be used to drill down to the desired depth for sampling. The split spoon is then driven to its sampling depth through the bottom of the augered hole and the core extracted.

When split-tube sampling is performed to gain geologic information, all work should be performed in accordance with ASTM D 1586-84.

Follow these procedures for collecting subsurface soil samples with a split spoon.

1. Assemble the sampler by aligning both sides of the barrel and then screwing the bit onto the bottom and the heavier head piece onto the top.
2. Place the sampler in a perpendicular position on the sample material.
3. Using a sledge hammer or well ring, if available, drive the tube. Do not drive past the bottom of the head piece or compression of the sample will result.

4. Record in the site logbook or on field data sheets the length of the tube used to penetrate the material being sampled, and the number of blows required to obtain this depth.
5. Withdraw the sampler, and open by unscrewing the bit and head and splitting the barrel. If a split sample is desired, a cleaned, stainless steel knife should be used to divide the tube contents in half longitudinally. The split-spoon sampler typically is available in diameters of 2 and 3 1/2 inches. A larger barrel may be required to obtain the required sample volume.
6. Without disturbing the core, transfer it to an appropriate labeled sample container(s) and seal tightly.

#### **3.3.4 Sample Containers and Preservation Techniques**

In order to ensure proper sample preservation, samples should be refrigerated to 9°C or less and holding time should be kept to a minimum.

#### **3.3.5 Field Quality Control Sampling Procedures**

There are no specific quality-assurance activities which apply to the implementation of these procedures. However, the following general QA procedures apply:

- All data must be documented on field data sheets or within site logbooks.
- All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior and after sampling/operation and they must be documented.

#### **3.3.6 Decontamination Procedures**

All sample equipment that comes into contact with soil or water must be decontaminated prior to sampling. Decontamination procedures for sampling equipment are described in the Decontamination of Field Equipment SOP.

## **APPENDIX D**

### **GEOPHYSICAL SURVEY RESULTS**

## **APPENDIX E**

### **SURVEYOR RESULTS**

siteid	PTID	Northing	Easting	Elevation
216	HA01	28603.39	19902.97	
216	HA02	28487.55	19858.77	
216	HA03	28374.74	19822.54	
216	HA04	28679.58	19873.28	
216	HA06	28379.95	19761.33	
216	SG01	28687.15	19871.25	
216	SG02	28654.52	19934.01	
216	SG03	28597.42	19935.59	
216	SG04	28539.73	19914.98	
216	SG06	28426.66	19876.77	
216	SG07	28369.31	19856.08	
216	SG08	28314.02	19834.49	
216	SG09	28274.3	19864.92	
216	SG10	28355.05	19781.43	
216	SG11	28303.51	19800.13	
216	SG12	28262.71	19815.7	
216	SG13	28221.73	19857.21	
216	SG14	28336.38	19741.3	
216	SG15	28285.55	19756.57	
216	SG16	28250.83	19774.29	
216	SG17	28206.61	19795.79	
216	SG18	28279.64	19720.17	
216	SG19	28232.41	19734.45	
216	SG20	28397.26	19763.71	
216	SG21	28453.63	19784.65	
216	SG22	28511.57	19804.1	
216	SG23	28567.98	19825.69	
216	SG24	28625.51	19846.04	
216	SG25	28639.57	19891.43	
216	SG26	28601.48	19907.36	
216	SG27	28582.46	19869.91	
216	SG28	28545.33	19888.09	
216	SG29	28524.74	19849.07	
216	SG30	28488.77	19864.52	
216	SG31	28467.92	19828.18	
216	SG32	28429.95	19845.81	
216	SG33	28412.63	19809	
216	SG34	28375.01	19822.88	
216	SS01	28672.58	19915.14	
216	SS02	28645.18	19966.67	
216	SS03	28573.72	19926.1	
216	SS04	28536.36	19911.45	
216	SS05	28439.6	19878.83	
216	SS06	28402.93	19864.04	
216	SS07	28365.39	19851.2	
216	SS08	28383.68	19764.49	
216	SS09	28432.84	19782.15	
216	SS10	28471.07	19795.72	
216	SS11	28549.97	19826.74	
216	SS12	28603.05	19842.47	
216	SS13	28641.27	19857.17	

# **APPENDIX F**

## **SOIL GAS RESULTS**



**APPENDIX G**  
ANALYTICAL RESULTS TABLE

## Description of Qualifiers

J	Data are considered quantitatively estimated.
J+	Data are considered quantitatively estimated with a possible high bias.
J-	Data are considered quantitatively estimated with a possible low bias.
N	Data are considered quantitatively presumptive due to tentative analyte identification.
NJ	Data are considered quantitatively presumptive due to tentative analyte identification; the associated value is considered quantitatively estimated.
R	Data are rejected and considered unusable for all purposes.
U	Analyte is considered not present above the level of the associated value.
UJ	Analyte is considered not present above the level of the associated value; the associated value is considered quantitatively estimated.
UJ-	Analyte is considered not present above the level of the associated value; the associated value is considered quantitatively estimated with a possible low bias.

Building 216  
Remediation Parameters

Sample ID	Sample Date	Depth	pH	Percent Water	Total Organic Carbon	Redox Potential
	CRQL Units		PH UNITS	PERCENT	0.025 PERCENT	mV
216-SS01S-01	9/25/95	1	9.4	4.4	na	na
216-SS02S-01	9/25/95	1	9	3.7	na	na
216-SS03S-01	9/25/95	1	9.3	4.9	na	na
216-SS04S-01	9/25/95	1	8.4	2.6	na	na
216-SS05S-01	9/25/95	1	8.7	8	0.42	320
216-SS06S-01	9/25/95	1	7.9	3.6	na	na
216-SS07S-01	9/25/95	1	8.5	6.5	na	na
216-SS08S-01	9/25/95	1	9	5.6	na	na
216-SS09S-01	9/25/95	1	8.9	5	na	na
216-SS10S-01	9/25/95	1	9	6.1	0.17	270
216-SS11S-01	9/26/95	1	9.2	6.7	na	na
216-SS12S-01	9/26/95	1	9.2	5.9	na	na
216-SS13S-01	9/26/95	1	9.1	4.4	na	na
216-SS14S-01	9/25/95	1	8.3	7.9	na	na
216-SS15S-01	9/25/95	1	9.2	4.2	na	na
216-HA01S-01	4/21/96	0.5	7.9	7.8	na	na
216-HA01S-02	4/21/96	2.5	7.6	23	na	na
216-HA01S-03	4/21/96	5	7.7	23	na	na
216-HA02S-01	4/20/96	0.5	9.2	8.5	na	na
216-HA02S-02	4/20/96	2.5	6.9	17	na	na
216-HA03S-01	4/20/96	0.5	7.6	19	na	na
216-HA03S-02	4/20/96	2.5	7.1	20	na	na
216-HA03S-03	4/20/96	5	7.3	24	na	na
216-HA04S-01	4/20/96	2.5	8	13	0.29 <sup>J</sup>	296
216-HA05S-01	4/20/96	2.5	7.7	23	na	na
216-HA05S-02	4/20/96	5	7.9	18	na	na
216-HA06S-01	4/20/96	2.5	8.1	17	0.56	240
216-HA06S-02	4/20/96	5	7.4	23	na	na
216-HA07S-01	4/20/96	2.5	7.6	25	0.84	254
216-HA07S-02	4/20/96	2.5	7.5	23	0.53 <sup>J</sup>	281

Building 216  
Metals

Sample ID	Sample Date	Depth	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Potassium	Selenium	Silver
	CRQL		0.5	2	0.2	0.2	0.5	0.5	0.2	500	0.5	0.5
	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
216-SS01S-01	9/25/95	1	<0.6	100	0.51	0.42	20.2	18.3	0.052 <sup>J</sup>	1340	1.4	0.52 <sup>J</sup>
216-SS02S-01	9/25/95	1	1.3	78.7	0.41	0.22	12.7	41.8	<0.033	809	0.48 <sup>J</sup>	<0.1
216-SS03S-01	9/25/95	1	4.2	31.9	0.22	0.24	8.4	25	<0.033	931	0.52 <sup>J</sup>	<0.1
216-SS04S-01	9/25/95	1	1.4	60.6	0.3	0.8	22.7	119	<0.033	772	<0.3	<0.1
216-SS05S-01	9/25/95	1	1.7	218 <sup>J</sup>	0.84	0.28 <sup>J</sup>	12 <sup>J</sup>	8.6 <sup>J</sup>	<0.033	1220	0.55	<0.1
216-SS06S-01	9/25/95	1	1	94.2	0.37	0.6	10.2	19.9	<0.033	658	<0.3	<0.1
216-SS07S-01	9/25/95	1	1.5	113	0.56	1.6	11.1	49.8	<0.033	871	<0.3	<0.1
216-SS08S-01	9/25/95	1	0.81	122	0.8	0.57	14.7	22.6	<0.033	1130	<0.3	0.15 <sup>J</sup>
216-SS09S-01	9/25/95	1	<0.6	94.5	0.41 <sup>J</sup>	0.87	18.9	28.5	<0.033	1120	<0.6	<0.2
216-SS10S-01	9/25/95	1	<0.6	184 <sup>J</sup>	0.47	0.45	20.8	18.9 <sup>J</sup>	<0.033	1560	1.3	<0.2
216-SS11S-01	9/26/95	1	<0.3	196	0.55	0.79	24.9	24.6	0.044 <sup>J</sup>	2220	<0.3	0.19 <sup>J</sup>
216-SS12S-01	9/26/95	1	<0.3	118	0.37	0.67	18.4	29.3	<0.033	1580	<0.3	0.14 <sup>J</sup>
216-SS13S-01	9/26/95	1	<0.3	132	0.37	0.58	22.7	38.8	<0.033	1570	<0.3	0.17 <sup>J</sup>
216-SS14S-01	9/25/95	1	0.97	84.4 <sup>J</sup>	0.45	0.98 <sup>J</sup>	27.9 <sup>J</sup>	105 <sup>J</sup>	<0.033	794	<0.3	<0.1
216-SS15S-01	9/25/95	1	<0.3	84.4 <sup>J</sup>	0.32	0.86	19.1	47.5 <sup>J</sup>	<0.033	1360	0.42 <sup>J</sup>	0.11 <sup>J</sup>
216-HA01S-01	4/21/96	0.5	1.2	94.5	0.52	<0.05	5.4	11.7	<0.02	399 <sup>J</sup>	<0.3	0.11 <sup>J</sup>
216-HA01S-02	4/21/96	2.5	3.9	394	1.5	<0.05	21.4	11.3	0.032 <sup>J</sup>	1530	<0.3	0.19 <sup>J</sup>
216-HA01S-03	4/21/96	5	3.9	1080	1.7	<0.25	17.2	6.6	<0.02	758 <sup>J</sup>	<0.15	<0.5
216-HA02S-01	4/20/96	0.5	2.1	57.4	0.28	<0.05	5.5	21.8	<0.02	302 <sup>J</sup>	0.36 <sup>J</sup>	<0.1
216-HA02S-02	4/20/96	2.5	5.5	301	1.3	<0.25	32.5 <sup>U</sup>	10.3	0.032 <sup>J</sup>	1150 <sup>J</sup>	<0.15	<0.5
216-HA03S-01	4/20/96	0.5	4.7	249	1.2	<0.25	19.6	8.5	0.03 <sup>J</sup>	1030 <sup>J</sup>	<0.15	<0.5
216-HA03S-02	4/20/96	2.5	5.2	768	1.4	<0.25	17.4	6.2	0.037 <sup>J</sup>	552 <sup>J</sup>	<0.15	<0.5
216-HA03S-03	4/20/96	5	3.5	311	1.9	0.34 <sup>J</sup>	21.4	8.9	0.044 <sup>J</sup>	1440	<0.6	<0.2
216-HA04S-01	4/20/96	2.5	2.5	273 <sup>J</sup>	0.75	<0.05	24.7 <sup>J</sup>	23.5 <sup>J</sup>	0.026 <sup>J</sup>	1000	<0.3	0.17 <sup>J</sup>
216-HA05S-01	4/20/96	2.5	4.5	1380	1.5	<0.25	11.5	5	0.033 <sup>J</sup>	533 <sup>J</sup>	<0.15	<0.5
216-HA05S-02	4/20/96	5	5.3	371	1.5	<0.1	37.5	20.3	0.054 <sup>J</sup>	1760	<0.6	<0.2
216-HA06S-01	4/20/96	2.5	1.8 <sup>J</sup>	239 <sup>J</sup>	0.97	<0.1	19.3	14.4	0.027 <sup>J</sup>	825 <sup>J</sup>	<0.6	<0.2
216-HA06S-02	4/20/96	5	2.5	464	1.5	<0.15	28.7	12.6	0.032 <sup>J</sup>	1240 <sup>J</sup>	<0.9	<0.3

Building 216  
Metals

Sample ID	Sample Date	Depth	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	Potassium	Selenium	Silver
	CRQL		0.5	2	0.2	0.2	0.5	0.5	0.2	500	0.5	0.5
	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
216-HA07S-01	4/20/96	2.5	3.8 <sup>J</sup>	408 <sup>J</sup>	1.5	<0.15	31.2	14.2	0.035 <sup>J</sup>	1340 <sup>J</sup>	<0.9	<0.3
216-HA07S-02	4/20/96	2.5	3.3	1050 <sup>J</sup>	1.2 <sup>J</sup>	<0.25	11.3 <sup>J</sup>	8.4 <sup>J</sup>	0.032 <sup>J</sup>	439 <sup>J</sup>	<0.15	<0.5

Analyses			30	30	30	30	30	30	30	30	30	30
Detections			23	30	30	16	30	30	14	30	7	9
Maximum Concentration			5.5	1380	1.9	1.6	37.5	119	0.054	2220	1.4	0.52
Arizona HBGL - Nonresidential			3.82	28700	1.34	244	5950	1400	123		2030	2030
Arizona HBGL - Nonresidential Hits			8	0	8	0	0	0	0		0	0
Maximum Background Concentration			44	1610	5	1.5	90	30	0.3	0	0.8	2.6
Background Hits			0	0	0	1	0	6	0	0	2	0

Building 216  
Petroleum Hydrocarbons

Sample ID	Sample Date	Depth	TPH, Recoverable	Diesel Fuel 2
	CRQL		10	10
	Units		mg/kg	mg/kg
216-SS01S-01	9/25/95	1	48	<0
216-SS02S-01	9/25/95	1	10 J	<0
216-SS03S-01	9/25/95	1	550	<0
216-SS04S-01	9/25/95	1	160	<0
216-SS05S-01	9/25/95	1	11 J	<0
216-SS06S-01	9/25/95	1	21	<0
216-SS07S-01	9/25/95	1	100	<0
216-SS08S-01	9/25/95	1	36	<0
216-SS09S-01	9/25/95	1	24	<0
216-SS10S-01	9/25/95	1	26	<0
216-SS11S-01	9/26/95	1	26	<0
216-SS12S-01	9/26/95	1	59	<0
216-SS13S-01	9/26/95	1	28	<0
216-SS14S-01	9/25/95	1	35 J	<0
216-SS15S-01	9/25/95	1	40	<0
216-HA01S-01	4/21/96	0.5	5.4 U	96 J
216-HA01S-02	4/21/96	2.5	3.6 U	11 J
216-HA01S-03	4/21/96	5	<2	91 J
216-HA02S-01	4/20/96	0.5	4.8 U	120 J
216-HA02S-02	4/20/96	2.5	3.1 U	<0
216-HA03S-01	4/20/96	0.5	<2	<0
216-HA03S-02	4/20/96	2.5	3 U	71 J
216-HA03S-03	4/20/96	5	3.2 U	<0
216-HA04S-01	4/20/96	2.5	6 U	26 J
216-HA05S-01	4/20/96	2.5	3.1 U	<0
216-HA05S-02	4/20/96	5	3.5 U	<0
216-HA06S-01	4/20/96	2.5	93 J	<0
216-HA06S-02	4/20/96	5	16	<0
216-HA07S-01	4/20/96	2.5	17 J	<0
216-HA07S-02	4/20/96	2.5	3.8 U	<0

Analyses	30	30
Detections	28	6
Maximum Concentration	550	120
Arizona HBGL - Nonresidential		
Arizona HBGL - Nonresidential Hits		
Arizona HBGL - Residential	7000	
Arizona HBGL - Residential Hits	0	

Building 216  
Volatile Organic Compounds

Sample ID	Sample Date	Depth	1,1,1,2-Tetrachloroethane	1,1,1,1-Trichloroethane	1,1,1,2-Tetrachloroethane	1,1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane
	CRQL Units		0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg
216-HA01S-02	4/21/96	2.5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA01S-03	4/21/96	5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA02S-02	4/20/96	2.5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA03S-02	4/20/96	2.5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA03S-03	4/20/96	5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA04S-01	4/20/96	2.5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA05S-01	4/20/96	2.5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA05S-02	4/20/96	5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA06S-01	4/20/96	2.5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA06S-02	4/20/96	5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA07S-01	4/20/96	2.5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061
216-HA07S-02	4/20/96	2.5	<0.00016	<0.00022	<0.00016	<0.0003	<0.000088	<0.00065	<0.00028	<0.00048	<0.00061

Analyses	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential	182	38500	28.6	84	4200	8				0.67
Arizona HBGL - Nonresidential Hits	0	0	0	0	0	0				0

Building 216  
Volatile Organic Compounds

Sample ID	Sample Date	Depth	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane (DBCP)	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene
	CRQL		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
216-HA01S-02	4/21/96	2.5	<0.0005	<0.00023	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	<0.00018	<0.00034
216-HA01S-03	4/21/96	5	<0.0005	0.00031 <sup>J</sup>	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	0.00035 <sup>J</sup>	<0.00034
216-HA02S-02	4/20/96	2.5	<0.0005	<0.00023	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	<0.00018	<0.00034
216-HA03S-02	4/20/96	2.5	<0.0005	<0.00023	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	<0.00018	<0.00034
216-HA03S-03	4/20/96	5	<0.0005	<0.00023	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	<0.00018	<0.00034
216-HA04S-01	4/20/96	2.5	<0.0005	0.00055 <sup>J</sup>	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	<0.00018	<0.00034
216-HA05S-01	4/20/96	2.5	<0.0005	<0.00023	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	<0.00018	<0.00034
216-HA05S-02	4/20/96	5	<0.0005	<0.00023	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	<0.00018	<0.00034
216-HA06S-01	4/20/96	2.5	<0.0005	<0.00023	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	<0.00018	<0.00034
216-HA06S-02	4/20/96	5	<0.0005	<0.00023	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	<0.00018	<0.00034
216-HA07S-01	4/20/96	2.5	<0.0005	0.0012 <sup>J</sup>	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	0.00066 <sup>J</sup>	<0.00034
216-HA07S-02	4/20/96	2.5	<0.0005	<0.00023	<0.00064	<0.00031	<0.00025	<0.00019	<0.0004	<0.00018	<0.00034

Analyses	12	12	12	12	12	12	12	12	12	12
Detections	0	3	0	0	0	0	0	0	2	0
Maximum Concentration	0	0.0012	0	0	0	0	0	0	0.00066	0
Arizona HBGL - Nonresidential	4200		4.07	0.08	38500	63	84			35000
Arizona HBGL - Nonresidential Hits	0		0	0	0	0	0			0



Building 216  
Volatile Organic Compounds

Sample ID	Sample Date	Depth	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Chlorotoluene	4-Chlorotoluene	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane
	CRQL		0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
216-HA01S-02	4/21/96	2.5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA01S-03	4/21/96	5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA02S-02	4/20/96	2.5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA03S-02	4/20/96	2.5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA03S-03	4/20/96	5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA04S-01	4/20/96	2.5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA05S-01	4/20/96	2.5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA05S-02	4/20/96	5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA06S-01	4/20/96	2.5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA06S-02	4/20/96	5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA07S-01	4/20/96	2.5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026
216-HA07S-02	4/20/96	2.5	<0.00022	<0.00021	<0.00092	<0.0006	<0.00034	<0.00032	<0.0003	<0.00051	<0.00026

Analyses	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential		200		8050		197				92
Arizona HBGL - Nonresidential Hits		0		0		0				0

Building 216  
Volatile Organic Compounds

Sample ID	Sample Date	Depth	Bromoform	Bromomethane	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	Dibromochloromethane
	CRQL		0.01	0.005	0.005	0.005	0.01	0.005	0.01	0.005	0.005
	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
216-HA01S-02	4/21/96	2.5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA01S-03	4/21/96	5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA02S-02	4/20/96	2.5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA03S-02	4/20/96	2.5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA03S-03	4/20/96	5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA04S-01	4/20/96	2.5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA05S-01	4/20/96	2.5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA05S-02	4/20/96	5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA06S-01	4/20/96	2.5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA06S-02	4/20/96	5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA07S-01	4/20/96	2.5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028
216-HA07S-02	4/20/96	2.5	<0.000099	<0.00063	<0.00036	<0.00023	<0.00077	<0.00024	<0.003	<0.00054	<0.00028

Analyses	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential	714	560	42	8050		924	350	4200		56
Arizona HBGL - Nonresidential Hits	0	0	0	0		0	0	0		0

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Volatile Organic Compounds

Sample ID	Sample Date	Depth	Dibromomethane	Dichlorodifluoromethane	Methylene Chloride	Ethylbenzene	Hexachlorobutadiene	1-Methylethylbenzene	Isopropyltoluene	m- & p-Xylene(s)	MTBE
	CRQL		0.005	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	Units		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
216-HA01S-02	4/21/96	2.5	<0.00033	<0.00055	<0.00039	<0.00024	<0.00047	<0.00028	<0.00037	<0.00054	<0.01
216-HA01S-03	4/21/96	5	<0.00033	<0.00055	<0.00039	0.00033 <sup>J</sup>	<0.00047	<0.00028	<0.00037	<0.00054	<0.01
216-HA02S-02	4/20/96	2.5	<0.00033	<0.00055	<0.00039	<0.00024	<0.00047	<0.00028	<0.00037	<0.00054	<0.01
216-HA03S-02	4/20/96	2.5	<0.00033	<0.00055	<0.00039	<0.00024	<0.00047	<0.00028	<0.00037	<0.00054	<0.01
216-HA03S-03	4/20/96	5	<0.00033	<0.00055	<0.00039	<0.00024	<0.00047	<0.00028	<0.00037	<0.00054	<0.01
216-HA04S-01	4/20/96	2.5	<0.00033	<0.00055	<0.00039	0.00029 <sup>J</sup>	<0.00047	<0.00028	<0.00037	<0.00054	<0.01
216-HA05S-01	4/20/96	2.5	<0.00033	<0.00055	<0.00039	<0.00024	<0.00047	<0.00028	<0.00037	<0.00054	<0.01
216-HA05S-02	4/20/96	5	<0.00033	<0.00055	<0.00039	<0.00024	<0.00047	<0.00028	<0.00037	<0.00054	<0.01
216-HA06S-01	4/20/96	2.5	<0.00033	<0.00055	<0.00039	<0.00024	<0.00047	<0.00028	<0.00037	<0.00054	<0.01
216-HA06S-02	4/20/96	5	<0.00033	<0.00055	<0.00039	<0.00024	<0.00047	<0.00028	<0.00037	<0.00054	<0.01
216-HA07S-01	4/20/96	2.5	<0.00033	<0.00055	<0.00039	<0.00024	<0.00047	<0.00028	0.00051 <sup>U</sup>	0.0008 <sup>J</sup>	<0.01
216-HA07S-02	4/20/96	2.5	<0.00033	<0.00055	<0.00039	<0.00024	<0.00047	<0.00028	<0.00037	<0.00054	<0.01

Analyses	12	12	12	12	12	12	12	12
Detections	0	0	0	2	0	0	1	1
Maximum Concentration	0	0	0	0.00033	0	0	0.00051	0.0008
Arizona HBGL - Nonresidential		80500	756	42000	60	16450		805000
Arizona HBGL - Nonresidential Hits		0	0	0	0	0		0

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Volatile Organic Compounds

Sample ID	Sample Date	Depth	n-Butylbenzene	n-Propyl benzene	Naphthalene	o-Xylene	sec-Butylbenzene	Styrene	tert-Butylbenzene	Tetrachloroethene	Toluene
	CRQL Units		0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.005 mg/kg
216-HA01S-02	4/21/96	2.5	<0.00035	<0.00023	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025
216-HA01S-03	4/21/96	5	<0.00035	0.0003 <sup>J</sup>	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025
216-HA02S-02	4/20/96	2.5	<0.00035	<0.00023	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025
216-HA03S-02	4/20/96	2.5	<0.00035	<0.00023	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025
216-HA03S-03	4/20/96	5	<0.00035	<0.00023	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025
216-HA04S-01	4/20/96	2.5	<0.00035	<0.00023	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025
216-HA05S-01	4/20/96	2.5	<0.00035	<0.00023	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025
216-HA05S-02	4/20/96	5	<0.00035	<0.00023	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025
216-HA06S-01	4/20/96	2.5	<0.00035	<0.00023	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025
216-HA06S-02	4/20/96	5	<0.00035	<0.00023	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025
216-HA07S-01	4/20/96	2.5	0.00059 <sup>J</sup>	0.0004 <sup>J</sup>	0.00044 <sup>J</sup>	<0.00023	<0.00027	<0.00013	0.00048 <sup>J</sup>	<0.00028	<0.00025
216-HA07S-02	4/20/96	2.5	<0.00035	<0.00023	<0.00024	<0.00023	<0.00027	<0.00013	<0.00028	<0.00028	<0.00025

Analyses	12	12	12	12	12	12	12	12	12	12
Detections	1	2	1	0	0	0	1	0	0	0
Maximum Concentration	0.00059	0.0004	0.00044	0	0	0	0.00048	0	0	0
Arizona HBGL - Nonresidential			16450	805000		8050			113	80500
Arizona HBGL - Nonresidential Hits			0	0		0			0	0

Building 216  
Volatile Organic Compounds

Sample ID	Sample Date	Depth	trans-1,2-Dichloroethene	Trichloroethene	Trichlorofluoromethane	Vinyl chloride
	CRQL Units		0.005 mg/kg	0.005 mg/kg	0.005 mg/kg	0.01 mg/kg
216-HA01S-02	4/21/96	2.5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA01S-03	4/21/96	5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA02S-02	4/20/96	2.5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA03S-02	4/20/96	2.5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA03S-03	4/20/96	5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA04S-01	4/20/96	2.5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA05S-01	4/20/96	2.5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA05S-02	4/20/96	5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA06S-01	4/20/96	2.5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA06S-02	4/20/96	5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA07S-01	4/20/96	2.5	<0.00041	<0.00027	<0.00042	<0.0015
216-HA07S-02	4/20/96	2.5	<0.00041	<0.00027	<0.00042	<0.0015

Analyses	12	12	12	12
Detections	0	0	0	0
Maximum Concentration	0	0	0	0
Arizona HBGL - Nonresidential	8050	504	122500	3.02
Arizona HBGL - Nonresidential Hits	0	0	0	0

Building 216  
Semivolatile Organic Compounds

Sample ID	Sample Date	Depth	1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Hexachlorobutadiene	Naphthalene	1,2,4,5-Tetrachlorobenzene	1,2-Diphenylhydrazine	1-Chloronaphthalene	1-Naphthylamine
	CRQL Units		0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	1.7 mg/kg	0.33 mg/kg
216-HA01S-02	4/21/96	2.5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024	<0.032	<0.025
216-HA01S-03	4/21/96	5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024 <sup>u</sup>	<0.032	<0.025
216-HA02S-02	4/20/96	2.5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024 <sup>u</sup>	<0.032	<0.025
216-HA03S-02	4/20/96	2.5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024 <sup>u</sup>	<0.032	<0.025
216-HA03S-03	4/20/96	5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024 <sup>u</sup>	<0.032	<0.025
216-HA04S-01	4/20/96	2.5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024	<0.032	<0.025
216-HA05S-01	4/20/96	2.5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024 <sup>u</sup>	<0.032	<0.025
216-HA05S-02	4/20/96	5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024 <sup>u</sup>	<0.032	<0.025
216-HA06S-01	4/20/96	2.5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024	<0.032	<0.025
216-HA06S-02	4/20/96	5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024	<0.032	<0.025
216-HA07S-01	4/20/96	2.5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024	<0.032	<0.025
216-HA07S-02	4/20/96	2.5	<0.023	<0.022	<0.017	<0.021	<0.017	<0.019	<0.013	<0.024 <sup>u</sup>	<0.032	<0.025

Analyses	12	12	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential	4200	38500	35000	200	60	16450	123	7.1				
Arizona HBGL - Nonresidential Hits	0	0	0	0	0	0	0	0				



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Semivolatile Organic Compounds

Sample ID	Sample Date	Depth	2-Methylphenol	2-Naphthylamine	2-Nitroaniline	2-Nitrophenol	2-Picoline	3,3-Dichlorobenzidine	3-Nitroaniline	4,6-Dinitro-2-methylphenol	4-Aminobiphenyl	4-Bromophenyl phenyl ether
	CRQL Units		0.33 mg/kg	0.33 mg/kg	1.7 mg/kg	0.33 mg/kg	0.33 mg/kg	0.66 mg/kg	1.7 mg/kg	1.7 mg/kg	0.33 mg/kg	0.33 mg/kg
216-HA01S-02	4/21/96	2.5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA01S-03	4/21/96	5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA02S-02	4/20/96	2.5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA03S-02	4/20/96	2.5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA03S-03	4/20/96	5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA04S-01	4/20/96	2.5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA05S-01	4/20/96	2.5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA05S-02	4/20/96	5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA06S-01	4/20/96	2.5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA06S-02	4/20/96	5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA07S-01	4/20/96	2.5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017
216-HA07S-02	4/20/96	2.5	<0.017	<0.031	<0.14	<0.017	<0.046	<0.053	<0.28	<0.17	<0.017	<0.017

Analyses	12	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential	2030		25					13			
Arizona HBGL - Nonresidential Hits	0		0					0			



Building 216  
Semivolatile Organic Compounds

Sample ID	Sample Date	Depth	4-Chloro-3-methylphenol	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	7,12-Dimethylbenz(a)-anthracene	a,a-Dimethylphenethylamine	Acenaphthene	Acenaphthylene
	CRQL Units		0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	1.7 mg/kg	1.7 mg/kg	0.33 mg/kg	0.002 mg/kg	0.33 mg/kg	0.33 mg/kg
216-HA01S-02	4/21/96	2.5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA01S-03	4/21/96	5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA02S-02	4/20/96	2.5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA03S-02	4/20/96	2.5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA03S-03	4/20/96	5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA04S-01	4/20/96	2.5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA05S-01	4/20/96	2.5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA05S-02	4/20/96	5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA06S-01	4/20/96	2.5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA06S-02	4/20/96	5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA07S-01	4/20/96	2.5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025
216-HA07S-02	4/20/96	2.5	<0.025	<0.065	<0.028	<0.021	<0.29	<0.28	<0.018	<0.15	<0.021	<0.025

Analyses	12	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential		1645		2030						24500	24500
Arizona HBGL - Nonresidential Hits		0		0						0	0

Building 216  
Semivolatile Organic Compounds

Sample ID	Sample Date	Depth	Acetophenone	Aniline	Anthracene	Benzidine	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzoic acid
	CRQL Units		0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	1.7 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	1.7 mg/kg
216-HA01S-02	4/21/96	2.5	<0.014	<0.025	<0.021	<0.53 <sup>U</sup>	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA01S-03	4/21/96	5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA02S-02	4/20/96	2.5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA03S-02	4/20/96	2.5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA03S-03	4/20/96	5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA04S-01	4/20/96	2.5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA05S-01	4/20/96	2.5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA05S-02	4/20/96	5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA06S-01	4/20/96	2.5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA06S-02	4/20/96	5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA07S-01	4/20/96	2.5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11
216-HA07S-02	4/20/96	2.5	<0.014	<0.025	<0.021	<0.53	<0.017	<0.018	<0.017	<0.017	<0.017	<0.11

Analyses	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential	42000	1008	122500	0.025	4.6	0.8	4.6		4.6	1645000
Arizona HBGL - Nonresidential Hits	0	0	0	0	0	0	0		0	0

## Semivolatile Organic Compounds

Sample ID	Sample Date	Depth	Benzyl alcohol	bis(2-Chloroethoxy)-methane	bis(2-Chloroethyl) ether	bis(2-Chloroisopropyl)-ether	bis(2-Ethylhexyl)-phthalate	Butyl benzyl phthalate	Chrysene	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenz(a,h)anthracene
	CRQL Units		0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg
216-HA01S-02	4/21/96	2.5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA01S-03	4/21/96	5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA02S-02	4/20/96	2.5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA03S-02	4/20/96	2.5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA03S-03	4/20/96	5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA04S-01	4/20/96	2.5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA05S-01	4/20/96	2.5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA05S-02	4/20/96	5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA06S-01	4/20/96	2.5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA06S-02	4/20/96	5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA07S-01	4/20/96	2.5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017
216-HA07S-02	4/20/96	2.5	<0.026	<0.02	<0.02	<0.019	<0.023	<0.017	<0.017	<0.049	<0.034	<0.017

Analyses	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential	122500		5	67	407	20300	462	42000	8050	0.46
Arizona HBGL - Nonresidential Hits	0		0	0	0	0	0	0	0	0

Building 216  
Semivolatile Organic Compounds

Sample ID	Sample Date	Depth	Dibenz(a,i)acridine	Dibenzofuran	Diethyl phthalate	Dimethyl phthalate	Diphenylamine	Ethyl methanesulfonate	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorocyclopentadiene
	CRQL Units		mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	1.7 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg
216-HA01S-02	4/21/96	2.5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018 <sup>UJ</sup>
216-HA01S-03	4/21/96	5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018
216-HA02S-02	4/20/96	2.5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018
216-HA03S-02	4/20/96	2.5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018
216-HA03S-03	4/20/96	5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018
216-HA04S-01	4/20/96	2.5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	0.14 <sup>J</sup>	<0.024	<0.017	<0.018
216-HA05S-01	4/20/96	2.5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018
216-HA05S-02	4/20/96	5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018
216-HA06S-01	4/20/96	2.5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018
216-HA06S-02	4/20/96	5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018
216-HA07S-01	4/20/96	2.5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018
216-HA07S-02	4/20/96	2.5	<0.014	<0.03	<0.028	<0.024	<0.017	<0.014	<0.039	<0.024	<0.017	<0.018

Analyses	12	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	0	1	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0.14	0	0	0
Arizona HBGL - Nonresidential			329000	4200000	10150			16450	16450	3.57	2870
Arizona HBGL - Nonresidential Hits			0	0	0			0	0	0	0

Building 216  
Semivolatile Organic Compounds

Sample ID	Sample Date	Depth	Hexachloroethane	Indeno(1,2,3-c,d)pyrene	Isophorone	Methyl methanesulfonate	N-Nitroso-di-n-butylamine	N-Nitroso-di-n-propylamine	N-Nitrosodimethylamine	N-Nitrosodiphenylamine	N-Nitrosopiperidine	Nitrobenzene
	CRQL Units		0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg
216-HA01S-02	4/21/96	2.5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA01S-03	4/21/96	5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA02S-02	4/20/96	2.5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA03S-02	4/20/96	2.5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA03S-03	4/20/96	5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA04S-01	4/20/96	2.5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA05S-01	4/20/96	2.5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA05S-02	4/20/96	5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA06S-01	4/20/96	2.5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA06S-02	4/20/96	5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA07S-01	4/20/96	2.5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02
216-HA07S-02	4/20/96	2.5	<0.022	<0.017	<0.02	<0.034	<0.092	<0.018	<0.025	<0.017	<0.015	<0.02

Analyses	12	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	0	0	0	0	0
Maximum Concentration	0	0	0	0	0	0	0	0	0	0	0
Arizona HBGL - Nonresidential	340	4.6	4900			1.05	0.8	0.13	1176		203
Arizona HBGL - Nonresidential Hits	0	0	0			0	0	0	0		0

Building 216  
Semivolatile Organic Compounds

Sample ID	Sample Date	Depth	p-Dimethylaminoazobenzene	Pentachlorobenzene	Pentachloronitrobenzene	Pentachlorophenol	Phenacetin	Phenanthrene	Phenol	Pronamide	Pyrene
	CRQL Units		0.33 mg/kg	0.33 mg/kg	1.7 mg/kg	1.7 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg	0.33 mg/kg
216-HA01S-02	4/21/96	2.5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026
216-HA01S-03	4/21/96	5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026
216-HA02S-02	4/20/96	2.5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026
216-HA03S-02	4/20/96	2.5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026
216-HA03S-03	4/20/96	5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026
216-HA04S-01	4/20/96	2.5	<0.0099	<0.019	<0.066	<0.18	<0.059	0.036 <sup>J</sup>	<0.022	<0.019	0.14 <sup>J</sup>
216-HA05S-01	4/20/96	2.5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026
216-HA05S-02	4/20/96	5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026
216-HA06S-01	4/20/96	2.5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026
216-HA06S-02	4/20/96	5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026
216-HA07S-01	4/20/96	2.5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026
216-HA07S-02	4/20/96	2.5	<0.0099	<0.019	<0.066	<0.18	<0.059	<0.023	<0.022	<0.019	<0.026

Analyses	12	12	12	12	12	12	12	12	12	12
Detections	0	0	0	0	0	0	1	0	0	1
Maximum Concentration	0	0	0	0	0	0	0.036	0	0	0.14
Arizona HBGL - Nonresidential		329	18.2	46				245000	3080	12250
Arizona HBGL - Nonresidential Hits		0	0	0				0	0	0

## **APPENDIX H**

### **SOIL PHYSICAL CHARACTERISTICS**

## **APPENDIX I**

### **QUANTERRA CERTIFICATES OF ANALYSIS**

Note: Certificates of Analysis will be provided in select copies of the Final Report. For access to a complete copy of the Certificates of Analysis, please contact the Camp Navajo Environmental Office at (520) 773-3208.



## **APPENDIX J**

### **SCOPE OF WORK**

# **APPENDIX K**

## **COMMENTS AND RESPONSES**

**APPENDIX L**  
ADEQ ACCEPTANCE LETTER